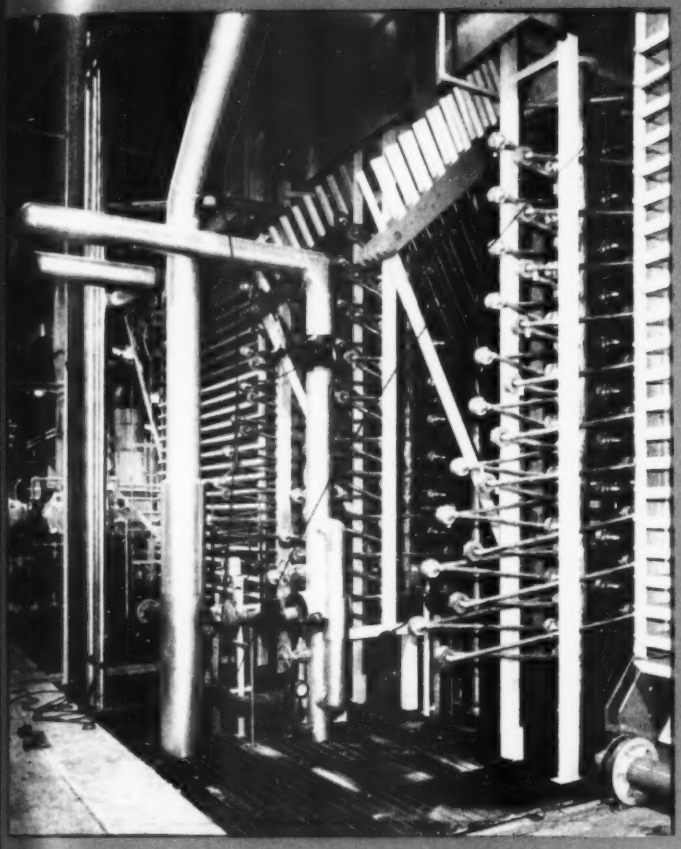
OCTOBER 1960

The Paper Industry



View of 3,274-ton board press featuring simultaneous platen closing mechanism at Bowaters Board Co. mill.

- New Bowaters Board Co. mill
- Synthetic resins accelerate market growth of corrugated board
- Economics of good lubrication
- How mill standards help production

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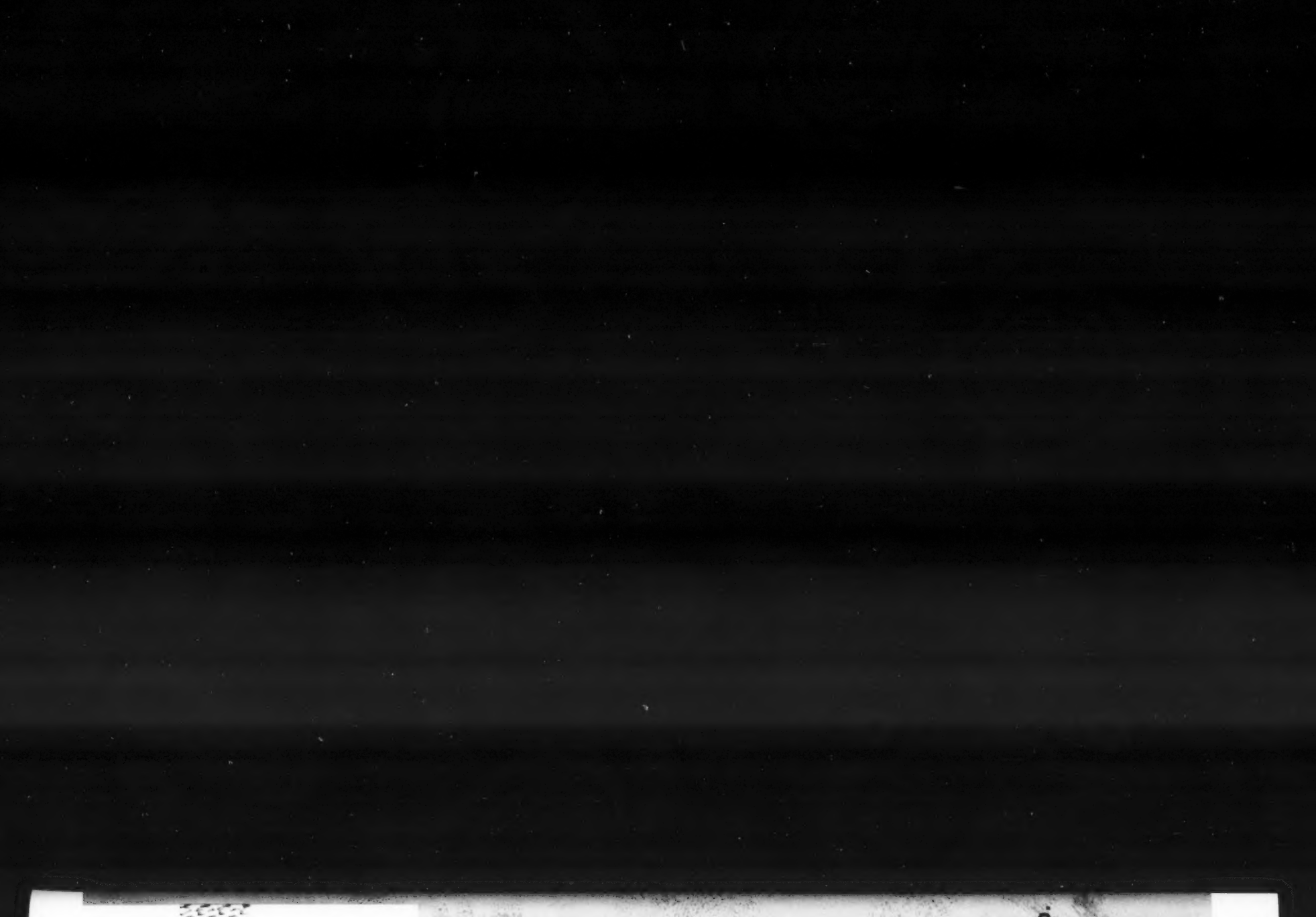

jamesbury

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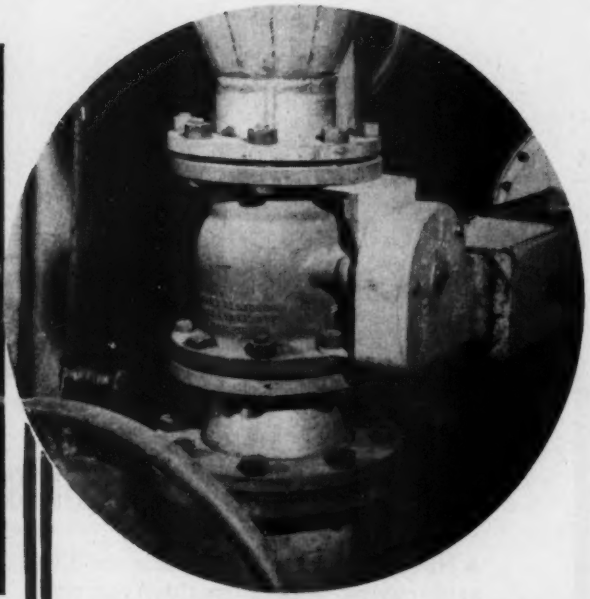
Jamesbury installation at Mead Corporation Chillicothe Plant



Jamesbury installation at Weyerhaeuser Longview Plant

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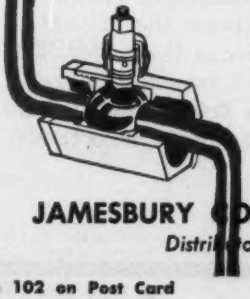

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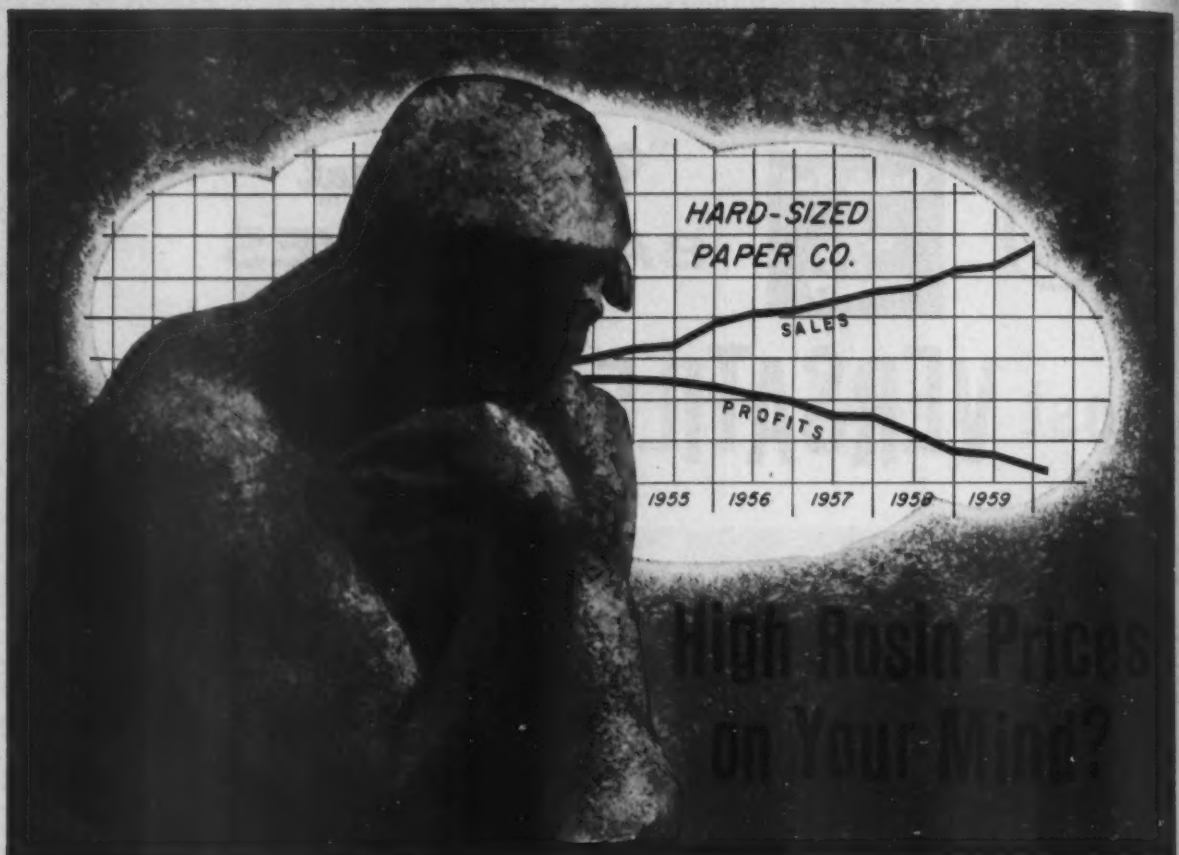

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The Paper Industry

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From our point of view..

No rose-colored glasses

The Pulp, Paper and Board Industry Report for the third quarter just issued by the U. S. Department of Commerce draws attention to the strong final demand of total goods and services which reached a new high in the second quarter, raising the GNP to a record annual rate of $505 billion.

Export shipments, the report stated, of all types of merchandise, running at an annual rate of $26.4 billion in the second quarter, were up $2.5 billion from the 1959 level. The export tonnage of paper and board for the first 6 months was up nearly 17 per cent over that of the first half of 1959.

It is also noted that Finland and Sweden are engaged in a large expansion of all segments of their pulp, paper and paperboard industry in anticipation of large foreign markets for these products, while a number of other countries are building new mills to meet some of their own requirements. New mill-construction plans in all parts of the world is a confirmation of the important role paper and paper products play in our modern civilization, as well as of good prospects for continuing high levels of sales.

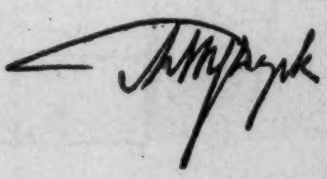
These achievements, despite repeated warnings of numerous economists who are recognizing signs that our economy has entered a more or less serious recession, must be chalked up as major credits to the ingenuity of man who at last is beginning to understand and control the fluctuations of business activity.

Recognizing and accentuating the positive achievements of our economy and realizing that something can be done to control business fluctuations is not "looking at it through rose-colored glasses". Nor does it involve the application of a psychotherapy based on the concept that business cycles are figments of our imagination and can be eliminated by a mere show of confidence.

It is not that simple. On the other hand, it is equally unrealistic to accept the business cycle as a natural phenomenon that comes to plague us with a certain regularity.

While business fluctuations are a reality and will continue to remain a problem of any industrialized nation, we are beginning to look far enough ahead in our planning and market evaluation to determine future requirements of old and new products with considerably more accuracy than was done in the past.

In doing this, and in refusing to panic at the first signs of a downward fluctuation, we are definitely precluding a recurrence of a recession comparable to that of the 1930's. Furthermore, with increased refinements of controls, we should gradually be able to diminish business fluctuations to a point where their resemblance to an old-fashioned business cycle is completely eliminated.



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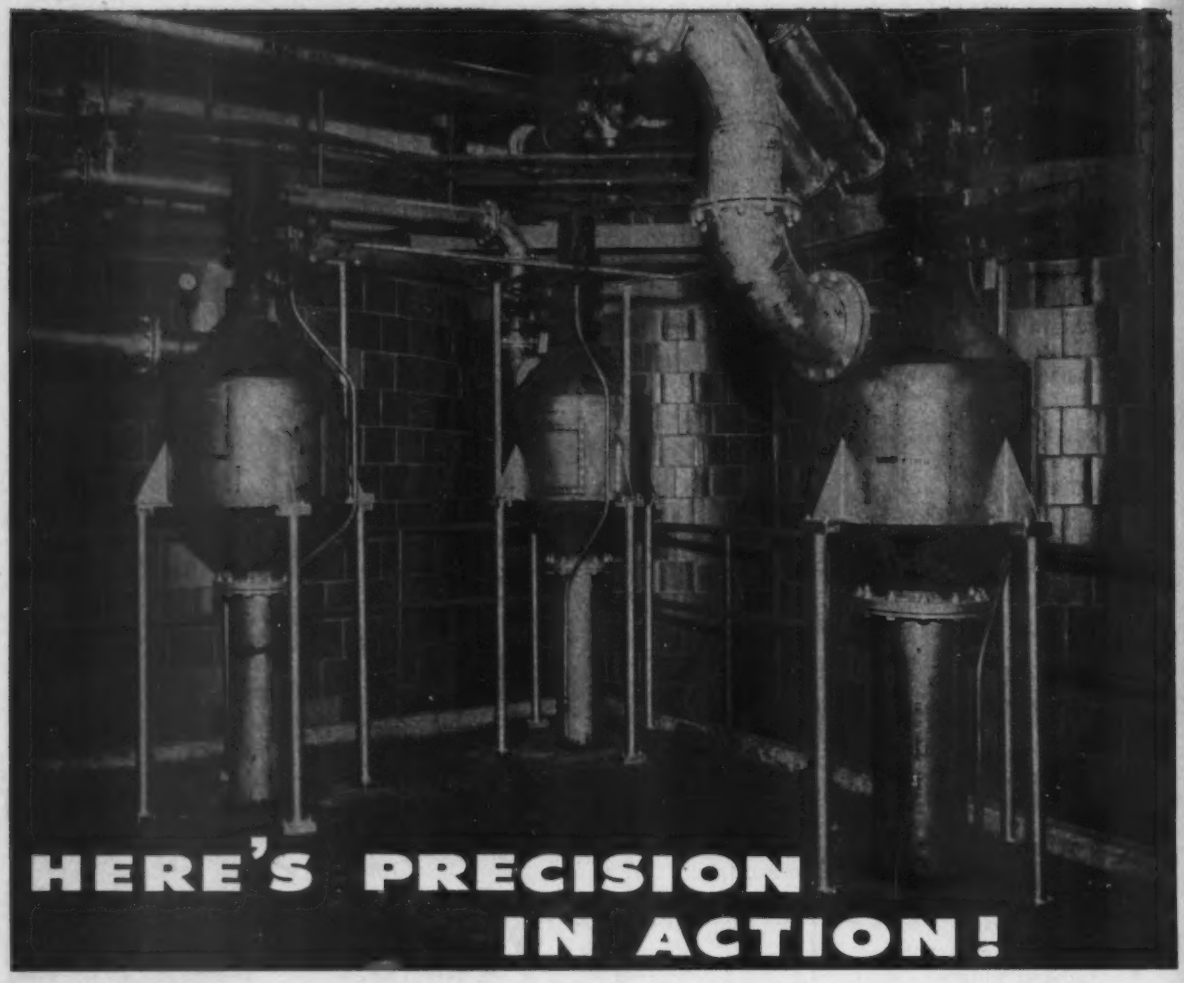

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Here are three of the eight DeZurik Regulators in an installation engineered by Charles T. Main, Inc., for the Chillicothe Paper Co. in Ohio on their No. 4 paper machine.

These DeZurik Regulators are designed to handle the full volume of stock—not just a sample.

DeZurik Consistency Regulators have a long record of accuracy, proved in performance. They're guaranteed to hold consistencies within limits of plus or minus .1% and many of them installed directly ahead of paper machines are holding consistencies to plus or minus .02%!

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Bowaters moves into more diversified production

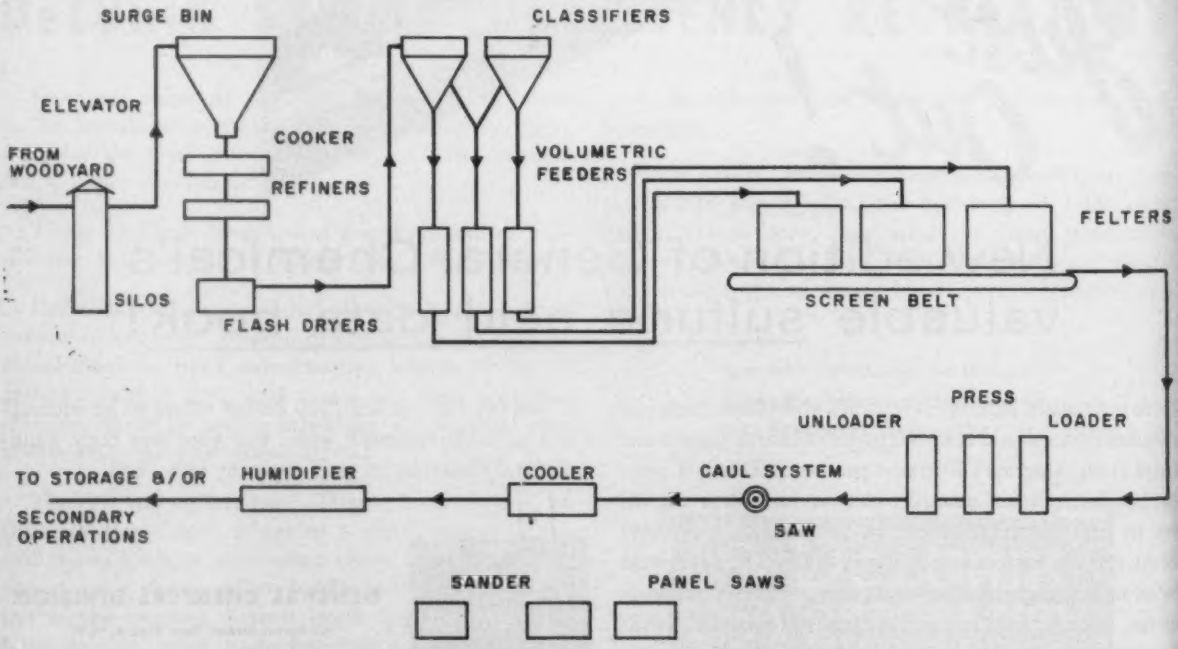
A. W. J. DYCK

Bowaters Board Co. mill has one of the fastest production cycles. Among highlights are the newly developed air process for dry felting, the flash-dryer system, and the simultaneous platen closing press.

BOWATERS recent completion of a hardboard mill in Catawba, S. C., marks (1) the first operation of a major hardboard mill in the eastern part of the U.S.A. and (2) Bowaters first move toward more diversified production. The mill uses a newly-developed air process for dry-felting in the formation area and is designed to produce 160,000,000 sq. ft. of board per year. Another installation highlight is the board press which is equipped with a simultaneous-closing mechanism to facilitate a faster pressing cycle and uniform board production throughout the press. In addition, there is a new time-temperature cycle developed for Bowaters humidification process which enables shipment of boards at any desired moisture-content level.

The mill has one of the fastest production cycles of any hardboard plant in the world. John G. Robinson, manager of the new mill, said that air-processed board can be made either thinner or thicker than hardboard normally produced by the wet process. It can be specifically tailor-made in manufacturing to meet critical field end uses. The density can be controlled by altering the time-pressure cycle to make board products with physical properties not available in natural woods. The air process, he said, allows for a better fiber formation and produces an unfinished board with a pleasing warm wood color and two smooth sides, each with superior finishing characteristics.

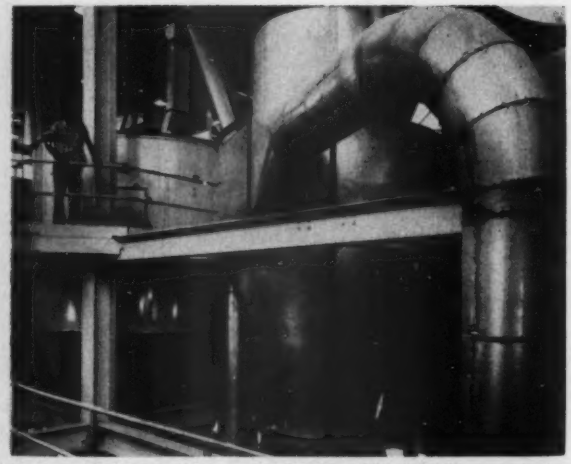
The board mill is located near the center of the nation's major furniture producing area in the Caro-



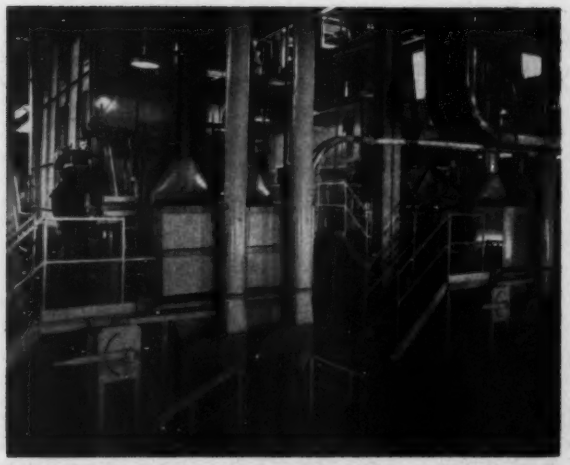
Flow sheet of hardboard production at Bowaters Board Co. mill.

American Defibrator stainless steel cooker operates at 150 psi pressure. 5-min. retention time.

Bauer Bros. No. 411 counter-rotating disc refiners, each driven by two 400-hp motors.

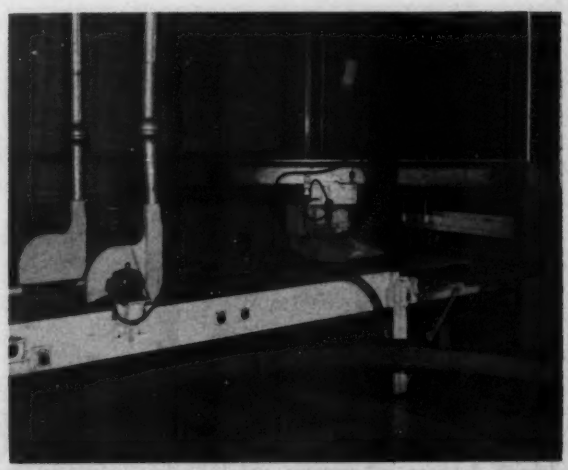


Williams Patent Crusher and Pulverizer fiber classifiers, equipped with revolving distributor plates and spinner blades.

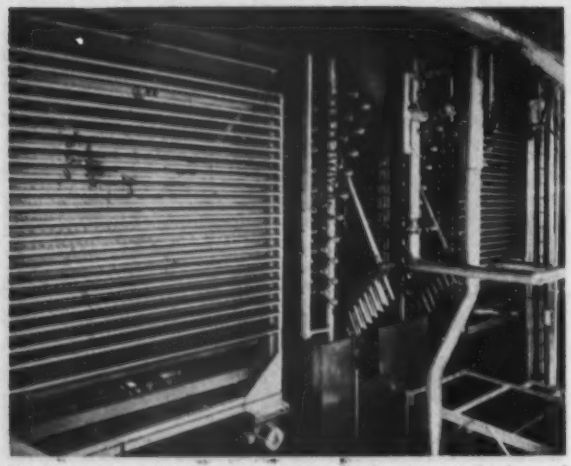


Cocker Machine & Foundry volumetric feeders, electrically regulated to feed the fibers in a proper ratio.

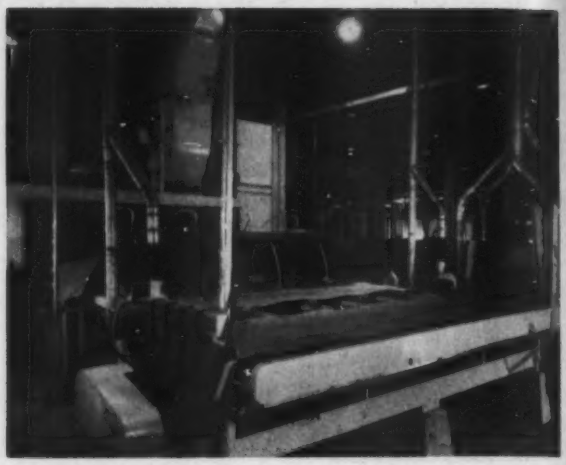
Washington Iron Works 4-unit felter and pre-compressor. Watching operation is P. A. Kvale, mill superintendent.



Washington Iron Works mat conveyor equipped with side-trim saws and transverse cut-off saw.



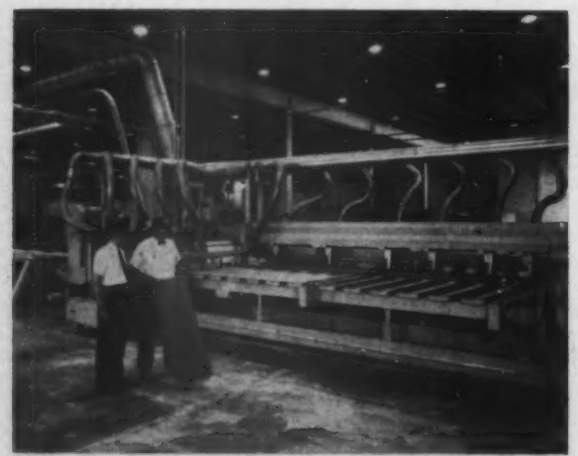
Washington Iron Works 5,270-ton press and automatic loader and unloader, of 20-mat capacity.



Mereen-Johnson trim saws and Moore Dry Kiln cooler are next in line after the press unloader.

Board is discharged from the cooler to a rail transfer car which carries it to the humidification tank.

Moore dry kiln humidification system features a time-temperature cycle to insure proper moisture content of the board.



John G. Robinson, mill manager, and J. K. Hahn, sales manager, view operation of Mereen-Johnson panel saw.

Yates American Machine three-belt sander sands boards to a tolerance of 0.005 in. at a speed of 90 linear ft.

Principal equipment installed at Bowater Board Co.'s Catawba mill

Woodyard operations

Barking drums (2), chain-suspended, 12 ft. dia. by 67½ ft. long, equipped with air-operated gates — Fibre Making Processes Inc.
Bucket elevator, 83-ft. vertical centers, two rows of 10-in. by 7-in. buckets — Link-Belt Co.
Chipper, 112-in., 10-knife, equipped with blower housing, mechanical brakes, and pneumatically operated spout covers — D. J. Murray Mfg. Co.
Chip screens, Rotex, Model No. 72 — Orville Simpson Co.
Chip silos (2), 200-cord capacity, tile construction — Chemical Linings Inc.
Plate magnets, in chip line — Dings Magnetic Separator Co.
Rechipper, 40-in., 6-knife — D. J. Murray Mfg. Co.
Rotary table feeders (2), 17 ft. dia., 1 rpm, 5,500-cu.-ft./hr. capacity — Link-Belt Co.

Chip cooking and refining

Cooker, equipped with paddle-type agitator, operating at 150 psi pressure — American Defibrator Inc.
Chip surge bin — Southern Engineering Co.
Disc refiners (4), No. 411, Size 40, counter-rotating, each-driven by two 400-hp synchronous motors — Bauer Bros. Co.
Liquid level indicators, equipped with stainless steel tapes, floats, guide wires and connections — The Vapor Recovery Systems Co.
Plate magnets — Dings Magnetic Separator Co.
Screw conveyors — Materials Handling Equipment Co.
Screw press — French Oil Machinery Co.
Tanks, wax and resin — Richmond Engineering Co.

Drying and classifying

Flash-dryer systems (2), consisting of refractory-less, gas-fired furnace, a 38,000 cfm fan, 36-in. dia. ductwork, and cyclone collector — Edward Renneburg & Sons Co.
Flash tank and condensate pump — Cochrane Corp.
Fiber classifiers, equipped with revolving distributor plates and spinner blades — Williams Patent Crusher & Pulverizer Co.
Volumetric feeders, electrically regulated — Cocker Machine & Foundry Co.

Felting and pressing

Air velocity meter — F. W. Dwyer Mfg. Co.
Adjustable speed drives, on conveyors, amplidyne-controlled, Kinamatic speed variator — General Electric Co.
Caul system, endless chain circulating-type — Washington Iron Works
Caul plates and wear plates — B. L. Montague Co., Vance Iron & Steel Co.
Controls, selsyn tie between precompressor and the caul system — General Electric Co.
Control instruments and valves — Fischer & Porter Co.
Cooler — Moore Dry Kiln Co.
Draw recorders (3), high precision — General Electric Co.
Drive, d.c. — General Electric Co.
Drive unit, synchronized with former, precompressor, and caul system — Eaton Mfg. Co., Dynametic Div.
Felter, 4-unit system; equipped with oscillating nozzles, traveling wire screen, suction boxes, and shave-off rolls — Washington Iron Works
Felter wire — Wilson Wire Works
Flow element and control instruments — Foxboro Co.
Heating and ventilating equipment — J. O. Ross Engineering Co.
Humidification system — Moore Dry Kiln Co.
Mat conveyor, two separate and independently driven belt sections, equipped with side-trim saws and transverse cut-off saw — Washington Iron Works
Motors — Reliance Electric & Engineering Co.
Panel saw — Mereen-Johnson Machine Co.
Pneumatic feeder and trim waste system — Rader Pneumatics Inc.
Precompressor, equipped with two endless belts, two high-pressure nip rolls, and a section of small low-pressure rolls — Washington Iron Works
Press, 5,270-ton pressure, driven by 475-hp drive system, equipped with 56-in. by 202-in. steam-heated platens, simultaneous platen closing mechanism, and temperature compensating platen guide — Washington Iron Works
Press hydraulic pumps — The Oilgear Co.
Press loader and unloader, 20-mat capacity — American Mfg. Co. Inc.
Pressure controller — Foxboro Co.
Sander, three-belt type — Yates American Machine Co.
Trim saws — Mereen-Johnson Machine Co.

lina's which will be one of the principal markets for the mill's output.

Engineering and construction supervision of the building project was handled by Bowaters Engineering & Development Inc. Daniel Construction Co., Greenville, S. C., was the General Contractor.

Woodyard operation

Wood is bought in segregated species and delivered to the mill by rail or truck. Wood delivered by rail is unloaded to hardwood or softwood storage piles by a crawler type crane or dumped directly into the flume by a self-propelled rake. Wood delivered by truck is unloaded to the piles by a 50-ton, crawler-type crane or dropped directly into the flume.

A 10,000 gpm vertical pump circulates water from the Catawba River through the flume at a rate of 6 ft./sec. Logs are conveyed by this flume to two chain-suspended barking drums, 12 ft. in dia. and 67½ ft. in length, each driven through fluid couplings by three 75-hp induction motors. The drums are equipped with air-operated gates at the discharge end.

Logs from the barking drums pass over a series of conveyors to a 66-in. wide sorting belt. From here accepted logs are fed into two 112-in., 10-knife chippers equipped with blower housings to discharge the chips into cyclones from which they are conveyed by belt conveyor to a series of Rotex, Model No. 72 chip screens. The chipper is further equipped with mechanical brakes and pneumatically operated spout covers.

Oversized chips are rechipped in a 40-in, 6-knife rechipper, while the accepted chips are carried by a high-pressure pneumatic conveying system to either of two, 200-cord-capacity tile silos.

The silos are equipped with 17-ft. dia., 1 rpm rotary table feeders which are capable of handling 5,500 cu. ft. of chips per hour from silo to a bucket elevator. The bucket elevator, with 83 ft. vertical centers and two rows of 10 in. by 7 in., 14-gauge type HS buckets, has a capacity to handle 6,300 cu. ft. of chips per hour to an elevated chip surge bin. Plate magnets located in the chute leading to the surge bin remove any tramp iron that may have been left in the chips.

Chip cooking and refining

A feed screw, equipped with variable speed drive to permit the setting of a constant flow rate into the cooker, is used to withdraw chips from the surge bin and feed them continuously into a cooker equipped with paddle-type agitator. The chips are steamed in the cooker at 150 psi pressure and 5-min. retention time. The steamed chips leave the cooker through a rotary valve to a distribution screw which supplies four metering screws.

Chips from the metering screws pass over plate magnets and then to the twin-screw feeders of each of the four No. 411, size 40 counter-rotating disk refiners. Each refiner is driven by two 400-hp synchronous motors, one for each disc.

During the process of refining, the fibers are also treated with various types of resins which are added into the center of each refiner through a hollow motor shaft. For standard grade board, a liquid phenolic resin is used, while special tempering resins can also be added at this point to achieve improved board properties.

Drying and classifying

The fibers from the refiners are dried in two flash-dryer systems through which they are pneumatically conveyed by heated air.

Each system consists of an 18,000,000 BTU double-shell, air-cooled refractory-less, gas-fired furnace of 9½ ft. in dia. and 8 ft in length. The furnace features a special multi-flame gas burner assembly and air diffuser to distribute the secondary air uniformly over the entire cross-section of the furnace. The furnace produces heated air of approximately 1000° F. to dry the fiber in approximately 6 sec.

An air-cooled product feed duct economizer of carbon steel construction, which is part of the system, permits recovery of heat radiated from the inner feed duct to preheat secondary air flowing into the furnace. The economizer is 5 ft. in dia. and 11½ ft. long.

A 38,000 cfm fan, driven by a 150-hp motor, is located in the 36-in. dia., 314-ft. long duct work. The system ends with a high-efficiency cyclone collector which is 9 ft. in dia. by 37 ft. long and constructed of ¼-in. steel. The cyclone collector has a helical-type air inlet and scroll-type air outlet which provides greater collection efficiency with lowest pressure drop. The collector is further equipped with skimmer blades at the lower end of the cones to facilitate removal of the dried fibers.

The dried fibers are discharged into mechanical air separators for classifying. The fibers are fed into a rising air current of the separator by means of a revolving distributor plate. The fine fibers are carried upward through the spinner blades and settle in the outer casing while the coarse fibers from the distributor plate and those rejected by the spinner blades settle in the central area and are discharged as a coarse fraction.

The fine fraction of fiber from both classifiers is collected in a single storage and metering machine called a volumetric feeder. The coarse fraction from each classifier is collected in separate coarse-fiber volumetric feeders. The volumetric feeders are electrically regulated to allow the dispersal of fibers in a proper ratio to produce exact hardboard requirements.

Felting, decompressing, trim and cut-off saws

Five metered streams of fiber — four coarse-fiber streams and one fine-fiber stream — are pneumatically conveyed into the felter through separate oscillating nozzles. The 136-fpm felter consists of four separate units. The fiber is deposited on a traveling wire screen through which excess air is removed into suction boxes located below the nozzles. A continuous multi-layer fiber mat is thus built up as the wire screen passes through each of the four sections of the felting operation.

The thickness and density of the mat formed in the felters is maintained through the use of side waste ducts which remove excess fiber discharged at the ends of the nozzle stroke. The mat is leveled by three shave-off rolls after it has passed through the first three felters. In the fourth felting area, a layer of "fines" is added to the mat to provide the finished board with superior surface characteristics. The felter is driven by Parmatic Speed Variator adjustable-speed drives to provide high accuracy speed regulation. This and three high-precision draw recorders insure critical speed relationships at the forming end.

From the felter, the mat is carried by the wire screen on which it was formed through a precompressing area where it is consolidated between two endless belts of the precompressor. Two high-pressure nip rolls apply the initial pressure on the mat after which the mat is held at reduced thickness by a section of small low-pressure rolls.

After emerging from the precompressor, the mat enters a conveyor which consists of two separate belt sections which are independently driven to provide draw control between the conveyor sections and also between the conveyor and the precompressor. The conveyor is equipped with side trim saws which edge-trim the mat and a transverse cut-off saw which saws the mat into required lengths. The mat cut-off saw is driven through line shafting from the caul system drive. This arrangement provides synchronization between the mats cut by the saw and the circulating caul sheets on which they are deposited.

Caul system

The caul system is a complete departure from existing systems in that it operates as an endless chain pulling the cauls from a point outside the unloader to a point where the mats are deposited on the cauls. The speed of the caul system is the same as the speed of the mat which requires a very close spacing of the cauls on the chain. The 20-in. gap in the mat cut by the cut-off saw permits the placing of mats on the circulating cauls with no change of speed. While the mat is being deposited on the caul, the latter is being released by the pulling chain and immediately engaged by a pusher chain with lugs. The pusher chain is also driven by the main caul chain which synchronizes it with the caul feed rate. Conventional belt conveyors carry the cauls to and from the press loader and the press unloader.

The mat lengths deposited on the cauls are accumulated on the loader until a full press load of 20 has been stored. The full load of mats and cauls is then pushed into the press while at the same time pressed hardboard and cauls are withdrawn from the opposite side of the press. The pressed hardboards are automatically separated — one at a time — from the cauls by vacuum cups as the cauls are discharged from the unloader. Synchronization of the caul chain speed and board separator carriage with the mat conveyor is accomplished through the use of Selsyn-controlled d.c. drives.

The press

The press — one of the key units of Bowaters hardboard operation — is capable of developing a pressure of 5,270 tons by means of hydraulic pumps driven by a total of 475-hp drives. The press is equipped with 56-in. by 202-in. platens heated by 850 psi steam pressure to a temperature of 525°F. The 20 mats are held in the press at press cycles of 2½ min. and at pressures rated up to 1000 psi.

A unique feature of the press is the simultaneous platen closing mechanism which allows the press to be closed at a rate of 530 in. per minute, which is essential in the production of uniform boards from the bottom to the top of the press. Another unique feature of the press is its temperature compensating platen guide to provide accurate alignment of the platens at any operating temperature.

Cooling and humidifying

Following the pressing cycle, the board is cut into approximate di-

(Continued on page 493)

How mill standards help production*

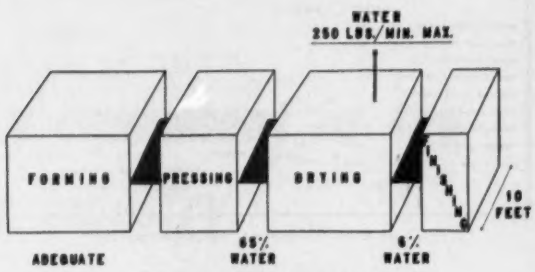


Chart I — Flow sheet of water removal system.

EUGENE C. INGALLS
Fibreboard Paper Products Corp.

WHAT is a mill standard? This question has come to mind many times. In our company, the term is limited to those standards — or norms — which are applied to variables which are of concern to production people. In this light, then, mill standards include norms for safety; for material quality — whether raw material, in-process, or finished goods; for crew size; for formulation; for equipment utilization; for production rate; for costs; and for other variables.

The primary purpose of a production unit is to produce, on time, a product having the required attributes of quality, at a price that will yield a profit in the market place. Anything which assists in attaining one or more of these goals helps production. Standards serve as a guide to desired production. Thus, they assist in goal attainment.

The point of major interest, then, concerns the word "How". How may mill standards help production? To illustrate one aspect of this "How": I have chosen a specific example — operating cost standards. This example has been chosen with particular reference to the primary purpose of a production unit — to produce, on time, a quality product at a cost yielding a profit.

It is essential that cost budgets accurately portray historical data tempered only by such future changes as are known or may be reasonably expected. This very fact seriously undercuts the value of these standards to production people. To use them as they exist, tends to fix or lock in those factors of inefficiency which existed over the period during which the standards were developed. It seems safe to say that no plant has yet reached the ultimate; so, these inefficiences always exist. It is a comfortable feeling to be able to say that the required volume of goods has been produced at budget cost or less. This same statement leads to a most uncomfortable feeling if it is re-worded to say that these goods were produced at the same old cost adjusted only for changes in the price of raw materials, utilities and labor!

Some time ago, Fibreboard became dissatisfied with this classic approach. The proper direction and challenge were lacking. We desired a method whereby cost standards could be further developed so that they might really serve as a guide to improved production performance.

The "High Standard" — a new concept

By this concept, performance is compared with the ultimate rather than with past history. One might say that we walk around and look at the cost picture from the other side. The "High Standards" is a real goal. It is not a given per cent better than present performance. It is an ideal to be reached with great difficutly.

The "High Standard" is developed by calculating the theoretical ultimate performance which can be expected from a particular productive unit or cost center under idealized conditions. Working from this new base — from the absolute top performance down, as it were — reasonable but tight allowances are made for conditions which will arise in actual production. These new norms then are converted to dollar values in the manner previously used to develop the cost budgets. Now, merely by shifting our observation point, we have a much clearer view of what our actual performance should be. We have established a performance goal which is no longer tied to history. Rather, we have a goal which is based upon the capabilities of our tools of production.

Examples of how it works

As outlined on Chart I, let us assume we have a 10-ft. trim specialty paper machine capable of running at a maximum speed of 600 fpm. We also shall assume that this machine has a drying system capable of removing 250 lb. of water per minute from our sheet. This latter figure has been calculated carefully from the available dryer surface and the existing air system (assuming the dryers to be clean — both inside and out, and that the condensate system is functioning properly). We shall make certain further assumptions. Among these assumptions would be that our forming section is capable of delivering desired sheet formation at maximum speed and that our press section, at this speed, is capable of delivering a sheet containing 65 per cent water. Paper at 6 per cent moisture is desired at the reel. Machine hour costs are assumed to be those costs of our cost budget, or $100 per scheduled operating hour.

Now, let us turn to Chart II. This

*Abridged from a paper presented at the 41st annual convention of PIMA.

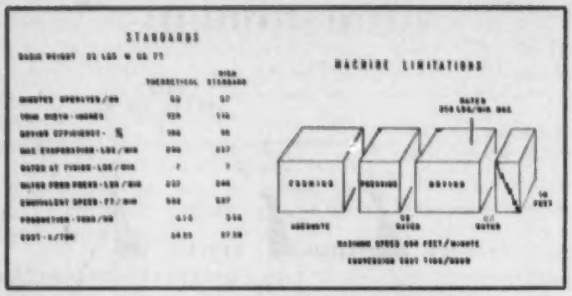


Chart II — Theoretical machine-operation.

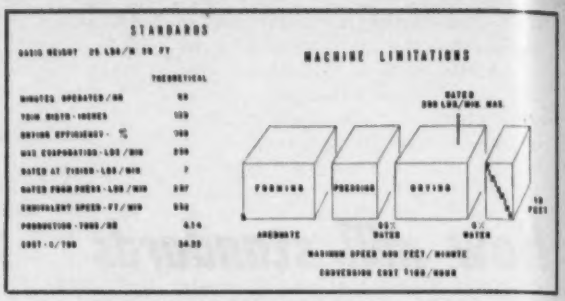


Chart III — High-standard machine-operation.

chart shows the theoretical operation of this machine on paper having basis weight of 25 lb. per 1,000 sq. ft. We can determine by calculation that coming to the dryer section we would have 279 lb. of water per minute when operating at top design speed. If our finished sheet is to contain 6 per cent moisture, this amounts to 7 lb. per minute. The difference, 272 lb. per minute, is more than the capacity of our dryers. Consequently, by calculation, we find that our maximum speed is limited by the dryer section to 552 fpm. Production of paper is limited to 138 lb. per minute or 4.14 tons per hour. At a machine hour cost of $100, we find the theoretical conversion cost to be $24.20 per ton.

This cost, of course, is unrealizable in practice since we have assumed ideal dryer conditions, 100 per cent running time, and 100 per cent trim width utilization. We may never expect to attain continuously these conditions in practice. Consequently, for our "High Standards," we may apply certain correction factors. For purposes of illustration: Take Chart III. Let us assume 95 per cent drying efficiency, 97 per cent machine trim attained through careful planning, and 95 per cent running time after allowance for clothing change, wash-ups, grade changes, start-ups, and other necessary factors.

Referring to Chart IV, we find that our effective operating time changes from 60 min. to 57 min. per hour. Our trim width is reduced to 116 in. Also, because of lowered dryer efficiency, the water to be evaporated must be reduced to 237 lb. per minute. This latter change reduces our machine speed to 527 fpm. to balance our drying capacity.

By calculation, using these factors, we find our "High Standard" production to be 3.66 tons per hour. Conversion cost amounts to $27.20 per ton.

For comparison, I have indicated historical budgeted production as 3.04 tons per hour and a conversion cost of $32.90 per ton. I have chosen these values to indicate that you usually will find the "High Standard" much harder to meet than budget. In fact, if this is not so, you should check your theoretical and high standard calculations.

Our aim, on this grade, is to produce 3.66 tons of quality board per hour at a conversion cost of $27.20 per ton. We know that to exceed this aim requires changes either in the press or dryer sections. We thus are in a position not only to judge our performance objectively, as well as the reasons we fell short of the "High Standard," but also to evaluate and justify any proposed equipment changes.

Obviously, if the grade or weight change, new values must be determined. For example: Chart V shows the effect of a change of basis weight from 25 to 20 lb. The major factor I wish to point out here is that, at 600 fpm., we have 222 lb. of water per minute to be removed by the dryer section. This is within its capability at 95 per cent efficiency. Accordingly, the machine should operate at a full 600 fpm. "High Standard" production then should be 3.32 tons per hour.

You will note that we have not applied the "High Standard" concept to the machine-hour cost. This is not an oversight. To carry through properly to a "High Standard" conversion cost, this should be done. However, the method would be similar to the example just cited. It would be applied to direct and indirect labor (including overtime), machine clothing, supplies, and other component costs making up the machine-hour rate.

STANDARDS

BASIS WEIGHT 25 LBS/M SQ. FT.

	THEORETICAL	HIGH STANDARD	HISTORICAL STANDARD
MINUTES OPERATED/HR.	60	57	55
TRIM WIDTH - INCHES	120	116	115
DRYING EFFICIENCY - %	100	95	92
MAX. EVAPORATION - LBS./MIN.	250	237	230
WATER AT FINISH - LBS./MIN.	7	7	7
WATER FROM PRESS - LBS./MIN.	257	244	237
EQUIVALENT SPEED - FT./MIN.	552	527	499
PRODUCTION - TONS/HR.	4.14	3.66	3.22
COST - $/TON	24.20	27.20	31.05

Chart IV — Standards of operation with 25-lb. basis weight paper.

STANDARDS

BASIS WEIGHT 20 LBS/M SQ. FT.

	THEORETICAL	HIGH STANDARD	HISTORICAL STANDARD
MINUTES OPERATED/HR.	60	57	54
TRIM WIDTH - INCHES	120	116	115
DRYING EFFICIENCY - %	100	100	100
MAX. EVAPORATION - LBS./MIN.	222	222	222
WATER AT FINISH - LBS./MIN.	7	7	7
WATER FROM PRESS - LBS./MIN.	229	229	229
EQUIVALENT SPEED - FT./MIN.	600	600	600
PRODUCTION - TONS/HR.	3.60	3.32	3.11
COST - $/TON	27.80	30.10	32.20

Chart V — Standards of operation with 20-lb. basis weight paper.

Lubricants and lubrication equipment in the pulp and paper industry

Part V — Economics of good lubrication

L. C. ROTTER

Chief Engineer
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Centralized lubrication systems affect mill-operating costs like a chain reaction. They reduce the "end-cost" of manufacturing by substantial lowering of costs in lubricant consumption, machinery repairs and down-time, power bills and accidents. Each saving leads to another.

THE QUESTION might well be asked. . . "Just how important is the need for modern methods of lubricant application as a means of lowering the end-cost of manufacturing?"

The best answer is reflected in the following documented facts. . .

1. The overall cost of mill and plant maintenance today exceeds $10 billion annually and is increasing at the rate of a billion dollars a year.
2. One out of every 12 employees is engaged in maintenance with a wage cost to industry of over $5½ billion.
3. Maintenance costs 67 1/3 per cent of net profits. In other words, it takes 24¢ of net sales to pay for each penny spent on maintenance.
4. Over two billion gallons of lubricant are used annually by industry.
5. It costs from two to four dollars to apply one dollar's worth of lubricant by conventional hand methods of lubrication, or a total lubrication cost of over two billion dollars.

The result is that lubrication offers one of the most immediate, productive and widespread areas where operating costs can be cut with spectacular results, as proven by one case history after another.

A challenge and an opportunity

It is true enough that for many years "manual lubrication" was the only way to accomplish the lubrication function. For a long time this was not of serious consequence because bearings were not the jewel-like assemblies they are today and machinery did not move very fast — so that casual, even careless, lubrication was often good enough. But failure to give modern, high-speed bearings and machines their exact lubrication nourishment is tantamount to committing sabotage. Too little, too much or the wrong kind of oil or grease leads to burnt-out bearings and a multitude of other troubles. You do not produce anything with a shut-down machine except headaches — expensive ones — and such losses cannot long be tolerated by any company, whose very existence depends upon its ability to hold its own in competitive markets. Therefore, improvement in methods of lubricant application consistent with modern machine requirements and mill operating techniques is rapidly coming to the fore. It presents an unusual combination of challenge and opportunity for increasing production both qualitatively and quantitatively and reducing operating costs.

Mill managers are trying harder now than ever before to reduce operating costs and top management is at last going beyond work simplification plans, cutting down overtime and laying off personnel. Management is taking a long, hard look at its growing investment in production facilities, and is seriously searching and insisting upon more effective methods to protect and increase dividends from this investment in terms of lower costs and greater productivity.

The squeeze between costs and prices makes it imperative that workable ways be found now, not next year, to preserve profit margins, and management has discovered a "gold mine" in the multiple benefits provided by modern centralized power lubrication systems.

Manual vs. automatic controlled application

For the sake of comparison, let us take a quick look at the basic characteristics of conventional methods of lubrication versus automatic centralized systems.

In contrast with the three-fold cost of the individual contact method, the centralized system involves just one cost. The initial cost is the total cost. There can be no cost to carry it around as it is permanently installed. The manner in which it is used controls the application of the lubricant, and hence the conditions that create bearing wear, causing damage which results in additional costs due to improper lubrication.

But the outstanding contrast is the fact that the centralized system refunds its total cost in lowered operating expense in all major categories, over and over again, as long as it is used, while individual contact methods continue to increase in cost, indefinitely.

This is readily explained, because no other single operating investment can affect so many vital overhead charges and influence productive efficiency, simultaneously, which is constantly revealed under actual operating conditions as follows:

1. Prevents waste of lubricant.
2. Reduces man-hours devoted to a lubricant application to a very minimum.
3. Eliminates machine down-time for lubrication.
4. Eliminates machine down-time for repairs due to bearing failure or faulty operation of worn parts resulting from inadequate lubrication.
5. Increases productive rate and efficiency of machinery to a uniform maximum.
6. Improves quality of product.
7. Eliminates product spoilage from dripping of excessive lubricant.
8. Reduces power requirements by eliminating friction — maintains power used consistent with work done.
9. Eliminates personal injuries and corresponding compensation costs attributable to lubricant application.
10. Prevents mechanical breakdowns that could mean a cancelled contract and loss of prestige and goodwill.

Areas where modern systems save

Here are the three major economic areas of mill management where modern lubrication methods can help save thousands of dollars.

Capital investment in plant equipment. Industry's continuing expansion in plant and production facilities necessitates protecting this investment with modern lubrication systems if the dividends of lower costs and increased production are to be realized.

These systems not only affect the quantity and quality of all goods produced, but insure longer machine service-life which in turn permits setting up greater depreciation reserves. As a direct result, it helps maintain corporate market position by making prices more competitive.

Modern "productive maintenance" methods. When the cost of any plant operating function can run as high as 20 per cent of the net sales dollar, then it certainly deserves the attention and critical analysis of management. And maintenance costs are ranging from three to 20 per cent today depending on the plant and industry.

Plant engineers agree that modern lubrication systems and procedures are the most important part of the maintenance function. They eliminate the human element, and positively protect against breakdowns caused by inadequate lubrication which can cost as high as $3,000 per minute in wasted machine hours and man hours.

In addition, the multiple savings effected by power lubrication systems are equivalent to an increase in sales without expanding the sales force. Therefore, they not only pay for themselves in short order, but go on reducing costs as long as they are used which justifies any expenditure required.

Expanding the sales appeal of original equipment. Incorporating a low cost automatic lubrication system as a component in the original equipment offers an unparalleled opportunity to increase the sales appeal of the manufactured product.

Your customers want machines and equipment that will provide long, uninterrupted service-life with a minimum expenditure for lubrication maintenance and parts replacement. Therefore, when incorporating automatic lubrication in the products, the manufacturer insures freedom from breakdowns and the resultant lost time and units of production that can never be recovered.

Lubrication and automation

We are constantly encountering evidence of progress in the trend toward automation, as measured by the extent to which automatic controls supplant manual effort and human discretion. More than $5 billion will be spent this year for automatic equipment and controls. However, to design and install a series of machine units with the necessary controls so as to automatize a particular production operation is one thing, but to insure its continuous and efficient operation, free of needless machine down-time for lubrication, or replacement of worn bearings and parts caused by inadequate lubrication, is another and most vital consideration.

Lubricant application, planned as a functional part of industrial lubrication, must provide for the automatic, precise and dependable controls essential to automation. These controls, when applied to lubrication, which is inherently part of the automation process, are incorporated in the modern automatic centralized system.

This method of lubricant application, and only this method, fulfills the five requisites necessary for efficiently serving the bearing requirements of any automatized production operation.

These requisites are as follows: (1) a system which permits automatic, controlled application while machines are operating to facilitate more accurate predictions of the output per time unit (day or week); (2) a system which will permit interchangeability of machine units without changing the lubrication system on the machines; (3) a system that will maintain a constant film of lubricant on bearing surfaces, thereby eliminating excessive wear and misalignment of moving parts responsible for a high level of rejects; (4) a system that helps increase machine output to a uniform maximum consistent with work done; and (5) a system that is sealed from lubricant supply to all points of application, thereby eliminating contamination of lubricant, and spoilage of work in process caused by drippage of excessive lubricant.

Lubrication is the only maintenance function which can be "automated". The importance of this truism is forcefully exposed in a statement from Mr. J. R. Hicks, staff engineer, Socony Mobile Oil Co. — "The cost of lost production due to unscheduled shutdown for repairs of an automated machine is so great that the very best in lubrication — lubri-

cants, systems and men, can be justified". Therefore, from the foregoing, it becomes clearly apparent that there can be no practical automation without automatic lubricant application.

From "lubrichaos" to modern power lubrication

To convert from "lubrichaos" to modern power lubrication requires five steps:

1. **Standardize on lubricants.** A little study of machine requirements may permit the maintenance department to cut the number of lubricants down to five or six standard or multi-purpose types which will fill all lubrication requirements in your plant.

2. **Standardize on grease fittings.** To reduce the number of lubricant application devices required to service each machine it is essential to standardize on one type of fitting. The hydraulic surface-check grease fitting is by far the best and most versatile. The ball-check in the head seals lubricant in and dirt out — thus giving maximum protection.

3. **Standardize on type of application device.** Select only those oil oil and grease application devices which will keep the lubricant free from contamination. Use portable filler pumps from which hand guns can be easily and cleanly filled in 30 seconds. Power-operated transfer pumps are also desirable, so that filler pump tanks can be filled directly from original refinery drums with no danger of the lubricant becoming contaminated by grit or dirt.

4. **Prepare for centralized lubrication.** The preceding three steps lead to a certain degree of efficient, scientific lubrication. However, they still depend entirely on the human element — the oiler. An automatic centralized lubrication system provides the best method of assuring that the right lubricant is applied to all bearings in the right quantity at the right time.
   The first step in the conversion process is to take one machine at a time. Install a centralized system with a manually, operated pump. With a few strokes of the pump handle an operator can cycle the lubrication system in 60 seconds while the machine is operating.

5. **Converting to automatic lubrication.** After injector circuits have been installed on all machines in a zone or group, the hand-operated pumps can be removed for use on the next bank of machines and replaced by individual automatic air or electric motor-operated pumps, completely eliminating the human element. The pump can deliver lubricant direct from an original 400 lb., or 120 lb. refinery drum or a self-contained reservoir built into pump.

One cannot be conscious of the multiple savings that accrue from controlled application of lubricants without recognizing the exceedingly high penalty imposed through neglecting to comprehend the full importance of industrial lubrication.

Recent trade paper articles provide forceful testimony to this fact through case histories supported by statistical information direct from management. For example: a tire manufacturer equipped plant machinery with centralized mass lubrication at a cost of $35,000, and showed that down-time for hand lubrication would have equalled the output of more than $250,000 worth of production a year; a steel mill claims a clear saving of $104,904 annually on bearings alone, plus a 40 per cent reduction in power consumption on tilting tables; a fire brick manufacturer installed centralized lubrication on 26 presses, and saved a minimum of $45,500 annually on repairs; a textile mill equipped 86 machines with centralized systems and reports an average saving of $1,726 per machine, annually; a coal company saved $75,000 a year on their stripping shovels, and $32,240 in labor cost alone in their preparation plant.

The foregoing case histories do not represent a few hand-picked, isolated instances — they are extremely representative wherever application of lubricants has been controlled through centralized systems.

Controlled application and the lubrication engineer

When a lubrication engineer has at his disposal the means to control lubricant application and hence operating costs, he can then rise above a level reliant upon the recommendations of lubricant compounders and the frustration of machinery builders, immune from the hazards of inadequate maintenance routines and practices, let alone the unpredictable consequences of the whim or will of the individual who carries the oil can or grease gun. His practice can be devoted to control of the economic factors of plant operation, such as:

1. Quality, quantity and cost of lubricants used.
2. Duration, and cost of time required to replenish lubricant, as consumed.
3. Expense of machine down-time for replacing worn parts due to improper lubrication.
4. Cost of new replacement parts necessitated by faulty lubrication.
5. Rate of production, as influenced by proper lubrication.
6. Waste and spoilage resulting from the manner of lubrication.
7. Power consumed by machinery in use.
8. Compensation costs resulting from accidents attributed to lubrication.

Five fundamentals of lubrication

In conclusion, it should be stated that industry must be made conscious of five essential facts regarding the lubrication function, if the multiple benefits available through controlled application are to be obtained:

1. The highest quality oil or grease, regardless of cost, cannot become a lubricant until applied to a bearing, therefore, provisions for the application of lubricant should take precedence over the selection of a lubricant.

2. The application of lubricant to maintain bearing surfaces, is a distinct operating function and should not be confused with general maintenance.

3. Conditions within modern industry today present a situation entirely new and far afield to those existing when the application of lubricant was so simple that the conventional oil can and grease gun embodied all provisions requisite to proper application.

4. These new, modern conditions are of such magnitude and complexity that the inherent deficiency of individual contact methods cannot be made to suffice, even though supplemented by elaborate record keeping of detailed lubrication instructions and check procedures, as has become common practice under routines established as preventive maintenance.

5. Provisions for the application of lubricant can be deemed adequate under all conditions and in all respects when, **and only when, they apply the right lubricant in the right quantity at the right time.**

Synthetic resins accelerate market growth of corrugated board

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Research Engineer

The introduction of new resins has greatly contributed to the dynamic growth of corrugated board production which currently has reached a rate of 110 billion square feet per annum.

PRODUCTION of corrugated board in the United States during 1960 is expected to reach 110 billion square feet, an 18 per cent increase over the 93 billion output of 1955. This strong growth trend is expected to continue and the 1965 market has been forecast at 130 billion square feet. Similar expansion for corrugated board markets is observed in all other industrial countries.

This growth rate is due only in part to the expansion of established markets. Perhaps even more important is the development of new end-uses for corrugated board, partly by displacement of conventional packaging materials (e.g., wood), and partly in entirely new applications. Much of this dynamic growth into new areas has been made possible by the introduction of new resins used in the production of corrugated board to improve quality, reduce manufacturing costs, and to impart special properties (e.g., moisture resistance, scuff resistance) to the product.

In general, these resins fall into three major categories:

1. Special adhesives and impregnating agents
2. Coatings
3. Liners and foamed resins

On a volume basis, the largest potential for synthetic resins in corrugated board is in the field of adhesives and impregnating agents. Improvements in this area have already been responsible for new applications, notably due to the introduction of moisture-proof corrugated board. Synthetic resins in this service are now being developed toward the point where they will be able to compete with starches in large production runs.

This development of specialty resins takes two main lines: introduction of chemically modified starches and; more recently, of wholly synthetic polymers in latex form, notably of polyvinyl acetate, butadiene-styrene latices, and acrylates.

Chemically treated starches

The introduction of chemically modified starches has greatly widened the versatility of corrugated board. These materials are produced by reaction of starch with cross-linking agents — e.g., formaldehyde, melamine-formaldehyde, resorcinol-formaldehyde, etc. — which have the chemical effect of forming bridges between starch molecules. By such cross-linking technique, it is possible to modify the physical characteristics of the starch paste, especially its viscosity, viscosity stability, penetrating ability, tackiness, stringiness, and suitability for treatment at either alkaline or acid conditions. These factors exercise significant influence on production speed and economics. Of equal importance is the effect of cross-linking on the properties of the final board — its strength, moisture resistance, shear resistance, etc.

Modified starches are today available to the corrugating industry in three main forms: high-viscosity starches, low-viscosity mixes, and pre-mixed adhesives. Of these, high-viscosity starches are produced by building up the molecular weight, using cross-linking agents as described above. To form low-viscosity starches, the molecular network of the unmodified starch is degraded by treatment with dilute mineral acid. Products in this category are employed chiefly for the preparation of carriers. Their introduction into the adhesives system of corrugators allows maintenance of more uniform viscosity and, in the case of some single facet formulations, achieves greater penetration and faster tack than can otherwise be attained.

High-viscosity and low-viscosity starches are applied in double-mixer corrugator systems which are also standard with unmodified starches. Drawback of these systems is relatively high equipment cost and the need for continuous careful control of adhesives preparation. Simpler single-mix operation is made possible — and is economically suitable for relatively small corrugators — by use of pre-mixed starches. Such mixes are produced by blending uncooked starch with a suspending agent such as pregelatinized starch. Formulations of this type are normally used with alkali or borax in preparing the corrugator adhesive. However, for special applications where alkaline medium is objectionable (e.g., for board intended for packaging glassware), adequate adhesion can also be attained at neutral or acid conditions.

Of these three types of modified starch, the greatest versatility is exhibited by the cross-linked materials, i.e., the semi-synthetic group in which the nature and concentration of cross-linking agent controls the product's properties. Particular interest attaches to the production of moisture-resistant corrugating adhesives. The original mixes of this kind, introduced during World War II, were formulated from starch, urea-formaldehyde, melamine-formaldehydes and aluminum sulfate. These mixes, however, require acidic conditions and high gel temperature. Furthermore, they have short paste life and corrugating machines employing these formulations must be run slowly and with great care.

Resorcinol-modified starches

Because of these shortcomings, these formulations have now been largely replaced by resorcinol-starch-formaldehyde mixes. Use of these formulations permits formation of a waterproof bond on the corrugator, charac-

terized by outstanding pin pull strength and lack of objectionable odor. Important from the manufacturing point of view are the following characteristics: alkaline setting (and therefore suitability for high machine speeds), compatibility with regular paste, suitability for impregnated board and other difficult media, long paste life, variability in degree of water resistance by adjustment of resorcinol content.

Resorcinol-bonded adhesives are applied by double-mixer technique. The carrier portion of the formula contains resorcinol starch, caustic soda, and water, and is degraded by a preliminary cook. In the mixer, it is joined by the formula's slurry portion, essentially an aqueous slurry of uncooked starch and formaldehyde (usually supplied in the form of solid paraformaldehyde). After mixing the two components, they are heated to 110°-115° F. for one hour and the resulting paste is applied to the machine.

Pottenger *et al* (TAPPI July 1956, 153A) report that resorcinol-modified adhesives can be used at corrugator speeds equal to those obtained with regular starch adhesives; machine speeds in excess of 500 fpm are reported on 42-lb. liners with the resorcinol-formaldehyde-modified formula.

Drawback of these resin-modified starches is the high cost of the adhesive, due primarily to expensive resorcinol. For this reason, it is suitable only for production of corrugated board which must be water-proof or at least water-resistant. Here, regular adhesives will not do the job while other resin-modified starches turn out to be more costly when account is taken of their overall slower machine speeds and greater waste product. Thus, the overall economics have been responsible for the current ascendancy of resorcinol-modified starches over other water-proof starch adhesives.

Use of completely synthetic resins

A completely different approach to corrugator adhesives is the use of completely synthetic resins. The superior bonding and moisture-proofing properties of several of these resins have been long established but their application to corrugator purposes has been long delayed by cost considerations.

Early commercial success is now indicated for the use of polyvinyl acetate as corrugated board adhesive. This resin shows quality advantages in maintaining the quality and reducing waste in the production of double-wall board. Particularly, the board's warp is substantially reduced.

The reason for this warp in normal double-wall board is migration of excess moisture, introduced with the liner and by the adhesive, toward the upper part of the assembly as heat is applied to set the starch bond. This phenomenon is avoided with polyvinyl acetate for two reasons: lower water concentration (1.8 lbs. water per 1000 sq. ft. board vs. 6 lbs. in the case of a 20 to 25 per cent starch), and elimination of the heat treatment stage since PVAc is a fast cold-setting resin.

Available plant data indicate that machine speeds with PVAc are up to twice as fast as with starch (up to 360 fpm on 500-lb. test double-wall. The resin is applied as a 40 to 50 per cent latex in water and a defoamer is added.

Key to economical application of PVAc is careful control of adhesive consumption. Walsh (Stein & Hall Co.) emphasizes the importance of keeping applicator roll and doctor roll true and parallel, maintaining proper adjustment of the wiper blade, obtaining minimum wrap over the applicator roll, and keeping speed of the glue roll at 90 to 95 per cent relative to paper. Under these conditions, adhesives cost still exceeds that of starch, but this is offset by greater machine speed. PVAc thus moves into the range of economic acceptability. So far, to be sure, its main use has been for specialty double-face board (including asphalt-laminated and polyethylene-lined). However, extension into broader fields is expected.

While synthetic resins find their most spectacular use in the corrugated board industry as adhesives, their importance goes well beyond this application. Of special interest is the use of such polymers for coatings, impregnating agents, and interlinings (both sheet and foamed type).

Coatings for corrugated board

Resins for coating purpose serve primarily for decorative purposes but their importance is growing for specialty applications. Thus, synthetic resin coatings are now entering the corrugated board field to provide abrasion resistance, anti-marring properties, anti-slip, better smoothness, etc.

For decorative purposes, synthetic resins are applied in three different ways: (1) as primer coating to improve the board's printing quality, ink receptivity, and appearance; (2) as part of the color coating itself, and (3) as overprint coating, a last coating provided to protect the surface and the decorative printing as well as to impart other functional properties to the product, as outlined in the preceding paragraph. In many instances, the end use is best served by combinations of these different types of coating.

For primer coatings, formulations based on carboxymethyl cellulose or ethylated starch are presently of principal importance but wholly synthetic resins — notably styrene-butadiene and polyvinyl acetate latices show promise.

Resins used in the color coating itself follow the general line taken in water-soluble paints and printing inks. Among the wholly man-made polymers now finding application for corrugated board, special interest attaches to polyvinyl acetate, acrylates and styrene-butadiene. For specialty purposes, polyethylene, isocyanates, and alkyds are also applicable.

In overprint coatings, the same line of resins is employed but acrylates and polyvinyl acetate are the leading synthetics because of their suitability for producing the clear coatings demanded by today's market.

Synthetic resins are applied as coatings in the form of water-dispersed latices, as hot-melt, or in organic solvents. For purposes of the corrugated board industry, the first two methods are of chief importance since organic solvents are costly and hazardous to handle.

Antimar coatings are designed to prevent marring of either the package or surfaces with which it may come in contact. Coatings in this category are produced typically by incorporating silicones or stearic acid, etc., into natural waxes or into polyethylene. Drag-reducing coatings, designed to suppress friction in shipment, employ vegetable oils or polyethylene glycol solutions.

Interlinings and foamed resins

Interlinings of polyethylene are now becoming important for moisture-proofing specialty board. Growing in significance are foamed resins (chiefly polystyrene and polyurethane which are incorporated into the board's structure). As for this latter group, Johnston (TAPPI, March 1960) points out, however, that their cost limits use to multi-functional application. Thus, advantage is taken of their ability to provide insulation as well as to add to the strength of the board in such special applications as corrugated board intended for shipping and storing frozen foods.

Overall, the use of synthetic resins in corrugated board production is still in its infancy. It is certain to grow rapidly as the versatility of synthetic polymers permits development of corrugated boards for new applications and, eventually, in lower-cost construction. It is equally certain that future developments in this area will accelerate the growth of the market for corrugated board.

Driver-less tractor moves six-ton paper rolls at Blandin Paper

A. S. KENNEWURF

Barrett Electronics Corp.

THE PRACTICAL and economical method used by Blandin Paper Co., Grand Rapids, Minn., to transport and position cumbersome, six-ton rolls of paper automatically is a virtually new concept of paper handling.

Briefly, Blandin uses a driverless industrial tractor, controlled by a Guide-O-Matic electronic system, to tow 12,000-lb. rolls of high-grade paper over a 400-ft. guided route directly to and from a paper-coating machine.

The story of this simple and efficient automated materials handling method began for Blandin more than one year ago. Business was increasing to the point where a new addition to the plant became necessary. Included in new machinery and equipment for the addition was a new paper-coating machine. The new unit was located on the mezzanine. This meant lifting the huge rolls of paper to the mezzanine and transporting them to the coating machine.

Productive operation

An overhead hoist lifts the huge 18-ft. long, 12,000-lb. roll of paper from the first-floor production area up to the mezzanine. The roll is accurately positioned and lowered onto a specially built trailer that has four-wheel steering and can be towed from either end. The trailer is towed by the Guide-O-Matic equipped tractor along a 200-ft. guided route directly to the paper-coating machine. The tractor stops automatically at an exact position on each trip so that the paper is ready for machine feeding.

After the paper roll has been removed from the trailer, a button is pressed on the steering column of the tractor to return it to the starting place on the mezzanine for delivery of another load. The tractor automatically stops in the precise position for the hoist to place another paper roll on the trailer. Total round-trip distance traveled over the route is 400 ft.

Features of system

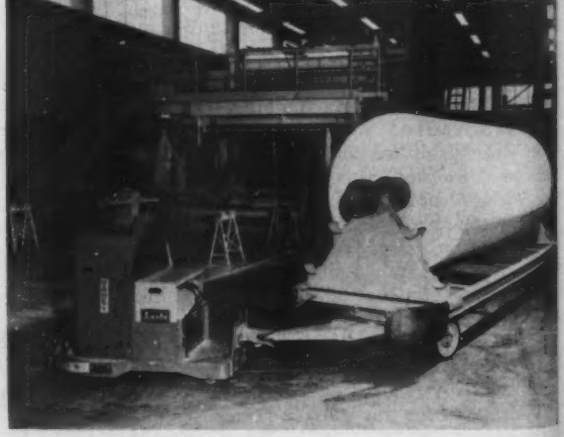
Among the predominant benefits of this system at Blandin Paper Co. are: (1) its comparative low cost of installation as against any other feasible method of handling the immense rolls of paper; (2) safe operation at constant speeds with no human driver required, resulting in superior operating advantage by eliminating possible error and insuring greatest accuracy of material movement; (3) a constant rate of speed to the tractor's destination—as it travels over a predetermined path. There is no lost time and, without a driver, there is no alternate speed-up and braking to put unusual wear on moving parts. This reduces ultimate maintenance.

Company officials are planning additional Guide-O-Matic installations.

How Guide-O-Matic works

The Guide-O-Matic system, as applied to materials handling, is available in two basic systems: magnetic or optical. With the magnetic system, a wire is embedded into the floor and energized by a low-voltage alternating current. A sensing device located under the tractor hood automatically follows the energized wire along the distance of the route without requiring a human driver. There is no physical connection between the vehicle and wire. With the optical system, the sensing device follows an ordinary painted line or colored tape on the floor by means of reflected light.

In either system, any number of stop stations may be located along the route of travel and any sequence of stops may be chosen. The tractor stops only at pre-selected stations and will not stray from its path. It maintains the same accuracy of movement during each trip down the aisles, around corners and through congested areas. No time is lost in maneuvering



A Barrett tractor equipped with Guide-O-Matic electronic system handles 12,000 lb. paper rolls to and from coater.

through tight spots. Speed is set to maintain a constant rate of travel. If ramps are located along the route, the tractor can be equipped to automatically accelerate while moving up the ramp, and to decelerate while descending.

If an outside force pushes the tractor from its path, dynamic braking action immediately stops it. Another safety precaution is the pressure-sensitive bumper which instantaneously applies a deadman brake on contact with any object which might be on the path of travel.

Special trailers ordinarily not necessary

Trailers normally used by paper manufacturers and converters to transport paper in rolls or on skids to and from production lines, or for handling bales of wastepaper, can be used in trailer trains with these units. It is feasible and possible to deliver finished paper mill products directly from production lines to shipping docks without assistance from tractor operators or a small army of dock handlers.

However, special equipment or trailers are available. Blandin Paper Co. used a unique dual-end, fifth-wheel, steer-type trailer of 6-ton capacity. The trailer is 15 ft, 9 in. long; 5 ft wide, and has a 12-ft. wheel base. Fifth wheels, top and bottom, are steel plates with double-ball raceways which house ½ in. steel balls. Floor wheels are 15 by 6 in. with pressed-on rubber tires and Timken bearings.

Blandin uses return trips of its trailer, which had specially designed ends, to cary five empty core spools, each weighing 1500 lbs.

Bowafers

(Continued from page 484)

mensions by trim saws and then conveyed through a cooler. After cooling, the boards are subjected to the humidification process by immersing them in circulating water. The time-temperature cycle developed for this humidification process, brings Bowater board to the proper moisture-content level for the required end-use.

Boards are then stored and subsequently sawed to the required sizes as they pass through a panel saw. A high-speed, three-belt sander is used to sand the boards to a caliper tolerance of ± .005 in.

Ventilating

A total of 33 air systems utilizing 36 fan motors are in operation inside the mill to provide necessary process and building ventilation. Air-generating fans have motor sizes varying from 1 hp to 125 hp.

Five heating-ventilation units, located on the north wall of the mill, supply 202,000 cfm of outside air for the inside of the building to compensate for air being exhausted by the manufacturing process.

Adjustable louvres located in the south wall of the building can be opened to allow fresh air to enter the plant.

Diameters of wire and thicknesses of sheet metal

D. S. DAVIS

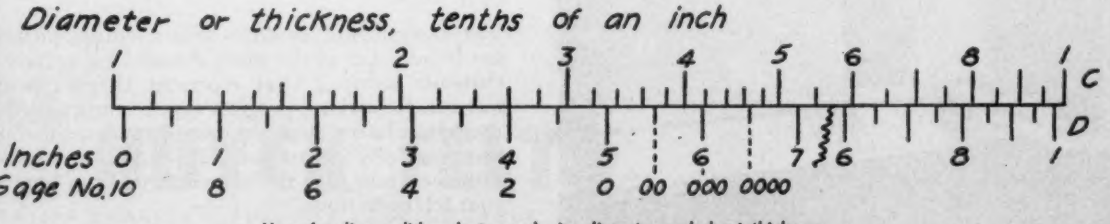
University of Alabama

THE SLIDE rule can be used for many purposes for which it was never intended. To read the approximate diameters of ferrous and nonferrous wire and the thicknesses of nonferrous sheet metal, use an ordinary inch rule with the C- and D-scales of the slide rule.

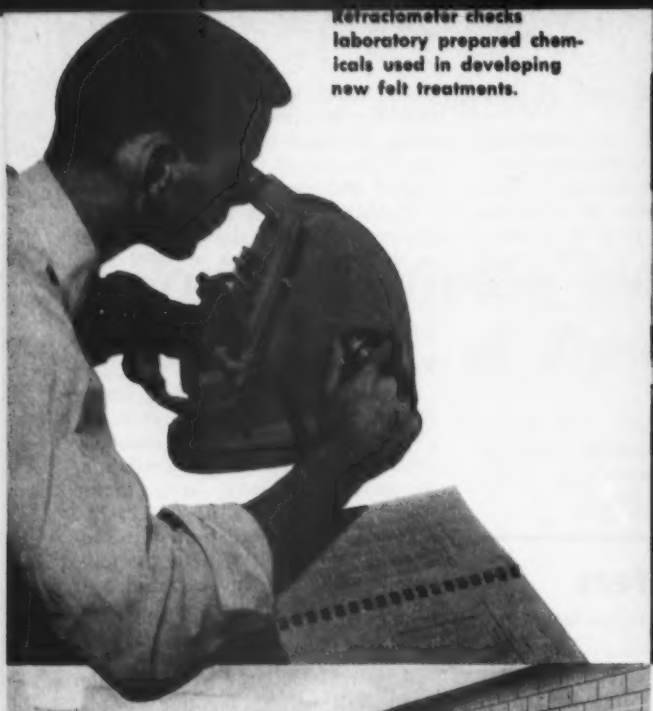
First, align 70 on C with 72 on D. For an American or Brown and Sharpe gage number of 0, align 5 inches with 331 thousandths of an inch on the C-scale. Gage numbers of 00, 000, and 0000 come at 5.5, 6.0, and 6.5 inches, respectively. Gage numbers of 1, 2, and 3 are read at 4.5, 4.0, and 3.5 inches, respectively, and so on.

For gage numbers greater than 10 (at 0 inches), turn the inch rule upside down, align 0 (for gage number 10) with 1 on the right hand index of the C-scale and read the diameters and thicknesses on the D-scale. Gage numbers 11 and 12 come at 0.5 and 1.0 inch, respectively.

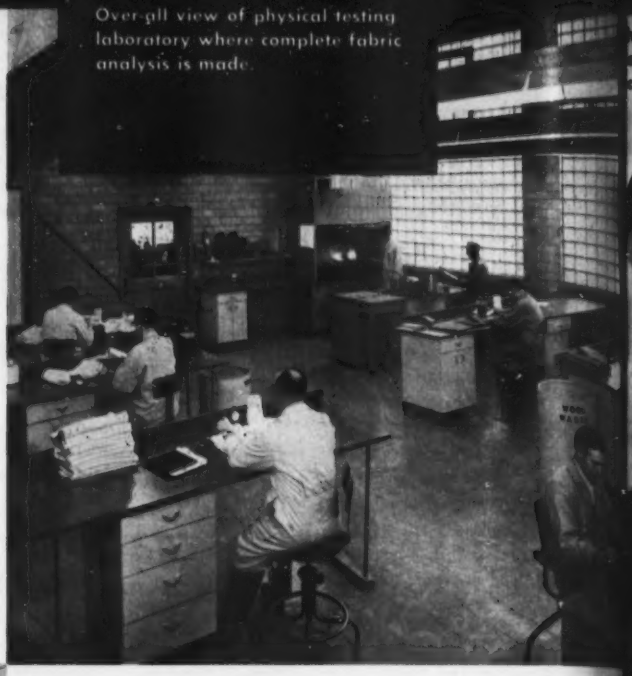
Values of diameters and thicknesses so read are slightly high for gage numbers from 0000 to 10 inclusive, exactly right for gage numbers 11 through 19, and slightly low for gage numbers from 20 through 40, inclusive. The maximum deviation from the correct diameter or thickness is 2.5 per cent; the average deviation over the entire range is 0.02 per cent.



Use of ordinary slide rule to read wire diameter and sheet thickness.



Refractometer checks laboratory prepared chemicals used in developing new felt treatments.



Over-all view of physical testing laboratory where complete fabric analysis is made.

...ately air conditioned, for precise ...ting work, this room houses the large ...stron that measures tension and resis... ...nce to compression over the range of 0.001 lb. to 2000 lbs.

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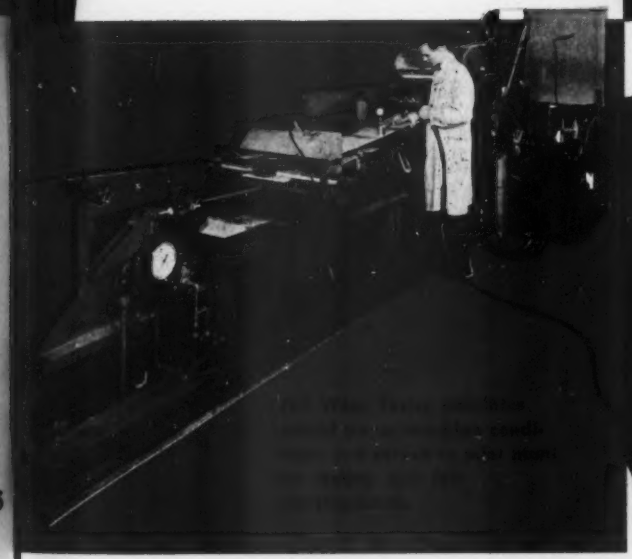
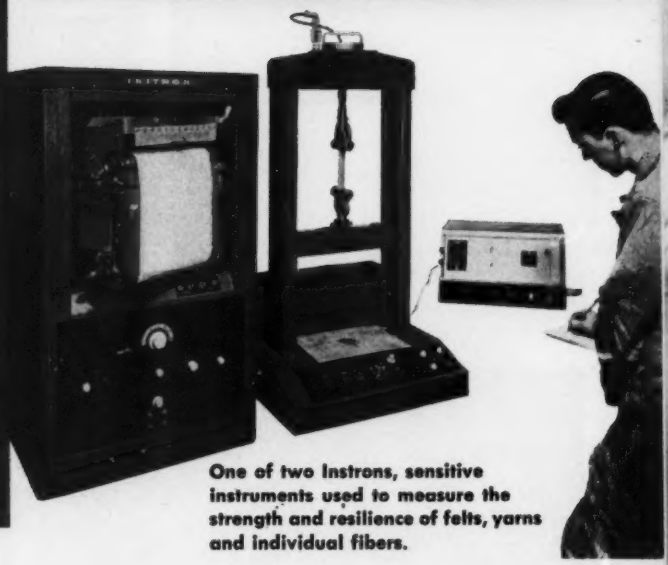
...a Vapor Fractometer, the modern tool for ...forming chromatographic analyses, ...curately seeks out types of felt damage.

Fiber diameters are measured with this projection microscope to assure the use of uniform diameter wools.





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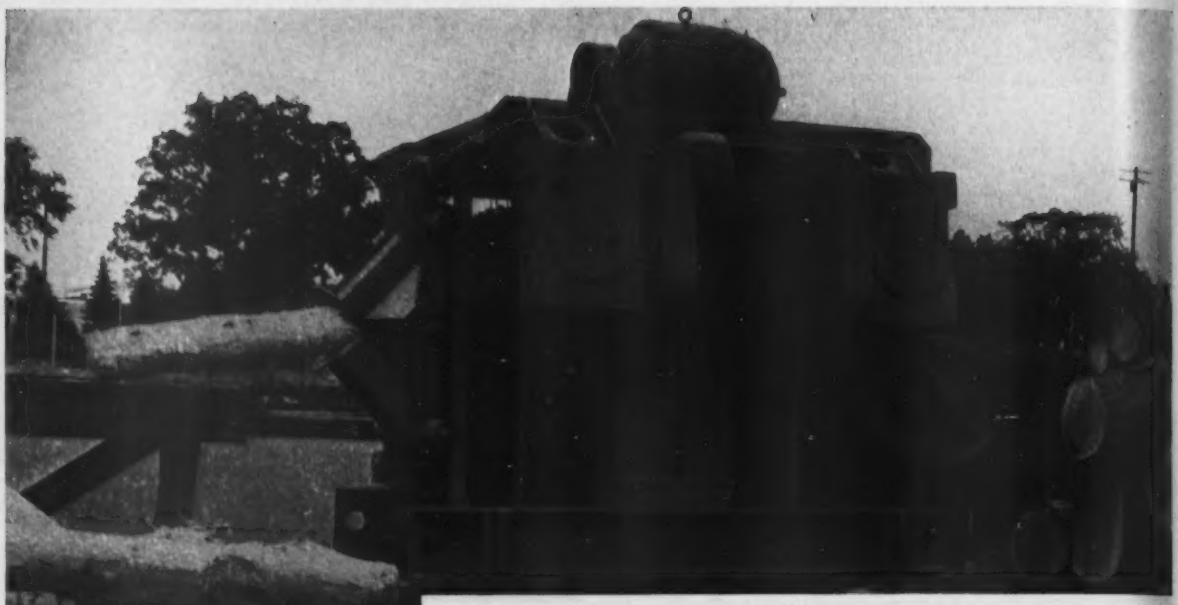

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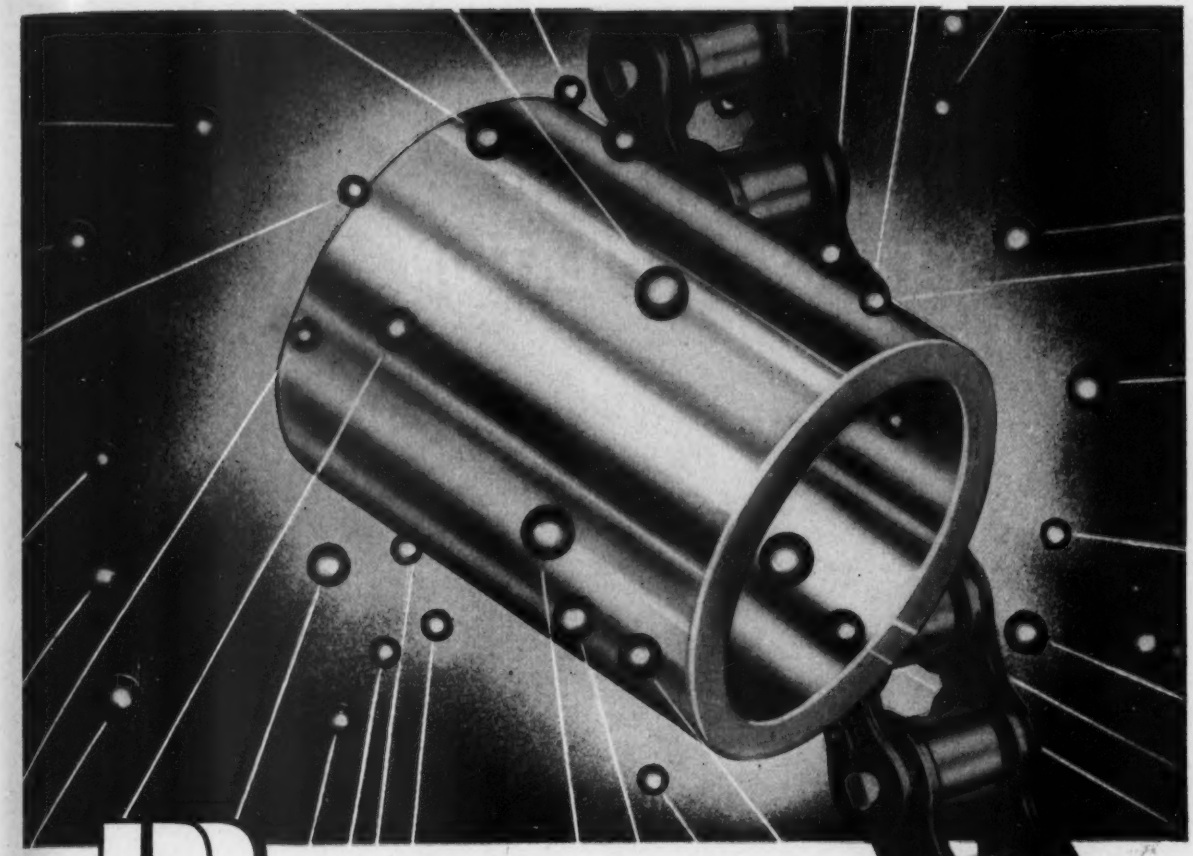

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BOOK 2657 has 154 pages of roller chain data. For your copy, contact your nearest Link-Belt office or authorized stock-carrying distributor. (See CHAINS in the yellow pages of your phone book.)

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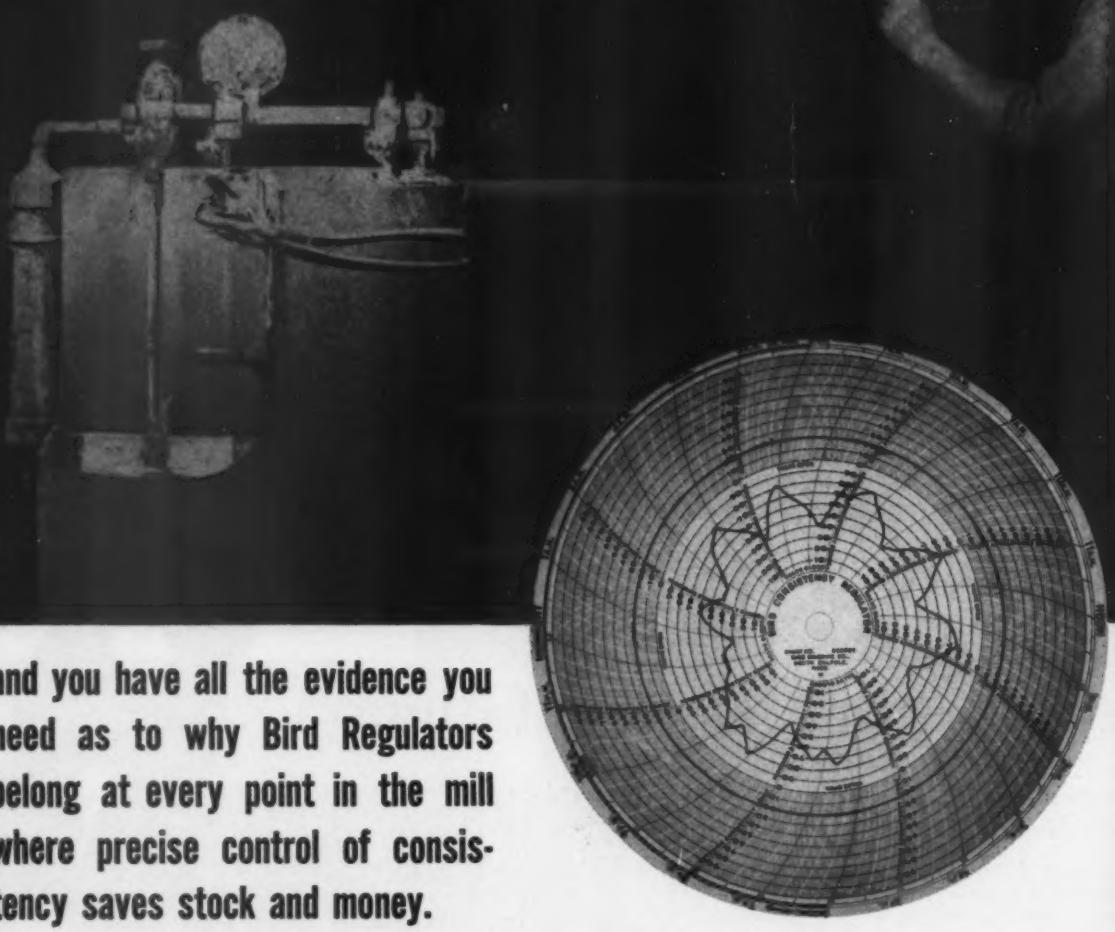

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CURRENT COMMENTS

Campaign to stifle mergers — Russia's backwardness in the pulp and paper field

WARREN B. BULLOCK

The governments' campaign to stifle the paper industry's urge-to-merge has caused the abandonment of the plans to amalgamate Union Bag-Camp Corp. and the Crosset Co., and now aims at the dissolution of the sensational acquisition of United States Envelope Co. by West Virginia Pulp & Paper Co.

The government's action to dissolve Union Bag-Camp Corp. and the anti-trust charges involving its acquisition of four smaller converting companies, brought about such an uncertainty affecting the possibility of arranging financing of the Crosset purchase, that Union Bag has offered to cancel its agreement to purchase Crossett at a price of nearly $150,000,000. Majority stockholders of Crossett are in agreement with Union Bag in dropping these negotiations.

The action against West Virginia is in the form of a civil anti-trust suit filed in Federal Court, New York, by the government, charging violation of the Clayton Act by its acquisition of the envelope company. The complaint claims that as a result of the purchase West Virginia's advantage over competitors "Would be enhanced to the detriment of actual and potential competition". The complaint also said that paper manufacturers might be foreclosed from selling paper to United States Envelope and that other mergers in the industry might be fostered.

Neither the Union Bag or the West Virginia cases will come up for final court action for several months. Other companies have previously been accused of illegally acquiring competitive concerns. The latest was the purchase by Inland Container Corp. of the General Box Co. of Louisville, Ky. International Paper Co. was under fire for its acquisition of enormous timberland holdings in the Pacific Coast region, but was able to show that this purchase was simply to acquire additional forest lands for its own operations. Crown Zellerbach Corp., second largest paper company in the nation, has an appeal pending from an order to divest itself of St. Helens Pulp & Paper Co., acquired five years ago. Scott Paper Co., which has taken over several other companies, and Continental Can Co., which acquired Robert Gair Co. to give it a foothold in the paperboard container field, are also under fire.

St. Regis and Mead, which have been active in acquiring various allied but non-competitive companies have escaped Federal Trade Commission attacks. The basic question in the merger field is whether competition is reduced by such mergers. In general, paper industry mergers are of the vertical type, to coordinate activities from the raw material field through paper production to the converting and distributing areas.

Industry observers can not understand how it will be possible to break up organizations which have been functioning as a whole for years and one observer is quoted as saying that it is all right to divorce the parents, but what about the children. The industry attitude is that concentration of output can produce efficiencies and economies for the reduction of costs which could be, and often are, passed on to the consumers.

In the face of these developments, two new mergers have been announced. St. Regis will give 87,500 shares of St. Regis stock for the entire capital of National Kraft Container Corp., of Jersey City, producer of corrugated containers. Sorg Paper Co. of Middletown, O., has acquired the Groff Paper Co. of St. Paul, Minn., as part of its planned program for integrating the conversion and distribution of an increasing portion of Sorg's basic papers.

Southwest Forest Industries, an important operator of lumber mills in Arizona and New Mexico, has broken ground for a $32,500,000 newsprint mill at Snowflake, Ariz., which in a year and a half is expected to be producing 210 tons of newsprint and 150 tons of kraft paper and board a day. This is part of the Arizona company's $40,000,000 expansion program to utilize lumber waste and ponderosa pine from the extensive Arizona forest lands. The company has already purchased five paper fabricating and distributing companies in Los Angeles and plans a $2,000,000 corrugated board plant near Phoenix.

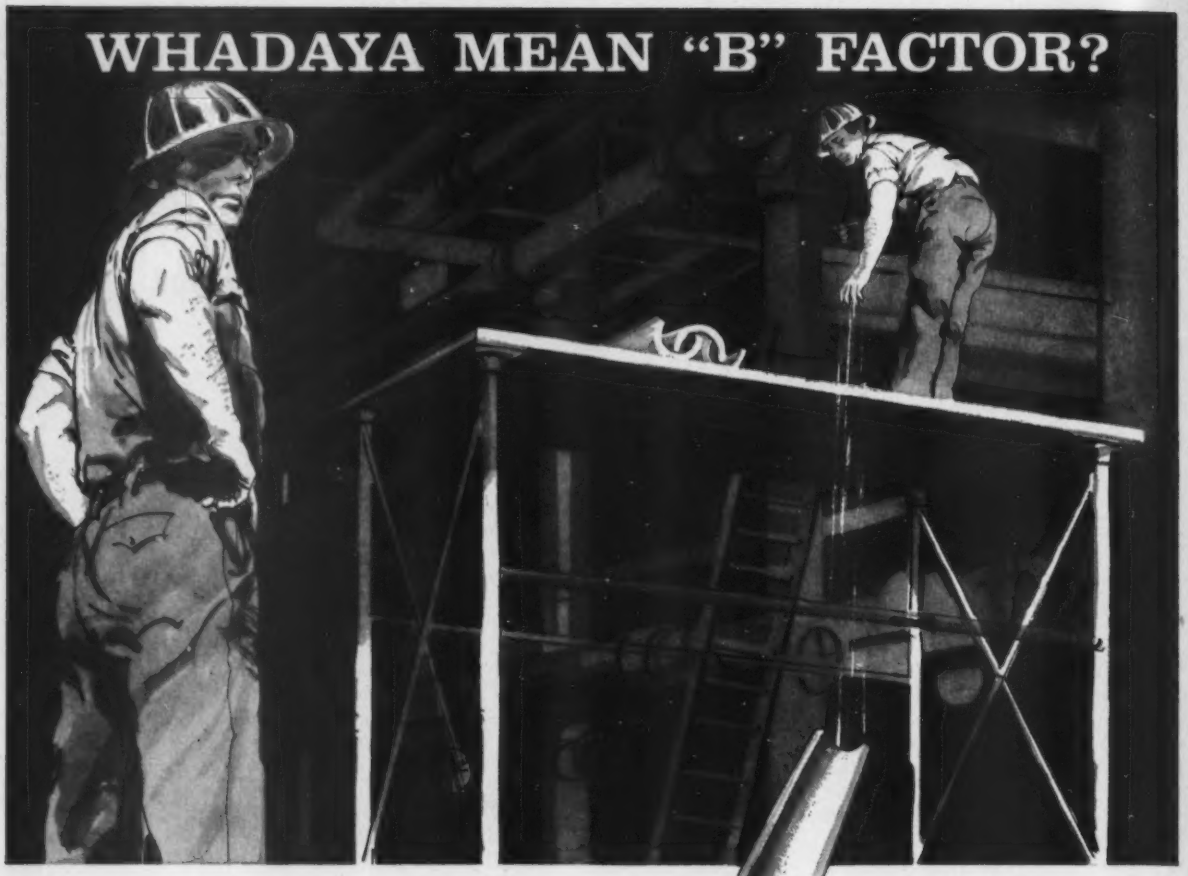
Russia is Behind

A recent issue of a Russian industry journal is sharply critical of Russia's backwardness in the pulp and paper field. Shortages in newsprint, writing paper and kraft paper are listed. Russia, however, hopes to attain an annual output of 4,150,000 metric tons in 1965. Forecasts of United States production by that date indicate a total of ten times that amount.

Tariff battle begins

Negotiations in the international tariff battle have opened at Geneva with a conference between the Common Market bloc countries and the rest of the members of GATT. This round of negotiations will last about 15 weeks and involves the extent to which the Common Market's anticipated 20 per cent reduction in external tariffs will be met with concessions from other members of the world group. Clarence Randall, special assistant to President Eisenhower, has attacked the farm policy of the Inner

WHADAYA MEAN "B" FACTOR?



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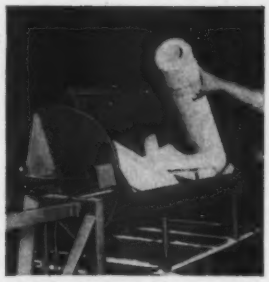

Tumbling apparatus illustrated above was used to simulate jars incurred in LCL shipments. After 29.2 minutes (204 revolutions) Magnesia insulation is completely broken down. Unibestos remains O.K. for installation because of its exclusive long-fibered *Amosite* asbestos.

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worth more, yet sold at competitive prices

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UNION ASBESTOS AND RUBBER COMPANY • FIBROUS PRODUCTS DIVISION

DEPT. 251, Bloomington, Illinois

For more data circle 112 on Post Card

Current Comments . . .

Six, and was joined by Canada's representative. After this conference is concluded, the general round of discussions by all participants in the international negotiations will open in January with the prospect of continuance through most of 1961.

Financial report

Paper mill issues were variable in price during August in Wall Street. As a rule, most issues retained their earlier figures, but in some instances such as Crown Zellerbach there was a sharp rise. In other cases, decreases were seen. Apparently the paper mill issues generally remained on an even keel except when special developments reacted on buyers or sellers.

Stock and Bond Quotations

New York Stock Exchange — Stocks

Closing Prices	September 9, 1960	August 9, 1960
American Can	38¼	38¼
Same Pref	37⅝	38⅞
Celotex	22½	22½
Same Pref	* 17¾-18¾	* 17-17⅛
Certain-Teed	12⅝	12
Champion P & F	29	—
Same Pref	* 92-93½	90¼
Chesapeake of Va.	35¼	* 34¼-34¾
Container	22⅛	22¼
Same Pref	* 90¼-92	* 89-90
Continental Can	37⅜	35½
Same Pref	79½	80
Crown Zellerbach	48⅞	42¾
Same Pref	94	91
Diamond National	36½	32½
Same Pref	30½	30⅞
Federal Paperboard	35⅝	36
Same Pref	22	21
Fibre Paper Board	29¼	31
Great Northern	42⅛	42¾
Hammermill	30½	28½
International	94⅜	97½
Same Pref	92½	* 93-94
Kimberly Clark	79⅜	76
KVP Sutherland	30	30
McAndrews & Forbes	* 28½-29	30¼
Masonite	29	29
Mead Corp.	33⅜	33
Same Pref	* 86½-88	* 85⅛-88
Minn & Ont	37	29
Nat. Vulc Vib	22½	22¼
Oxford Paper	26⅞	27
Same Pref	* 91⅛-93	—
Rayonier	18¼	16⅞
Riegel Paper	30¼	31½
St. Regis	35⅞	35
Same Pref	* 92-96	* 92½-93
Scott	86⅝	89⅛
Same $4 Pref	* 89-92	89⅛
Same $3/40 Pref	* 76-76⅞	76
Sealright	32¼	34¼
Standard Packaging	28⅜	28⅜
Same $1.60 Pref	* 82-96	85¼
Same $1.20 Pref	34½	32¾
Same 6% Pref	33⅜	—
Union Bag-Camp	31¾	34⅛
United Bd & Cart	* 22-22⅝	—
U.S. Gypsum	96¼	99
Same Pref	156	159
West Va. P & P	38¾	39
Same Pref	* 96½-97	* 93¾-97½

New York Stock Exchange — Bonds

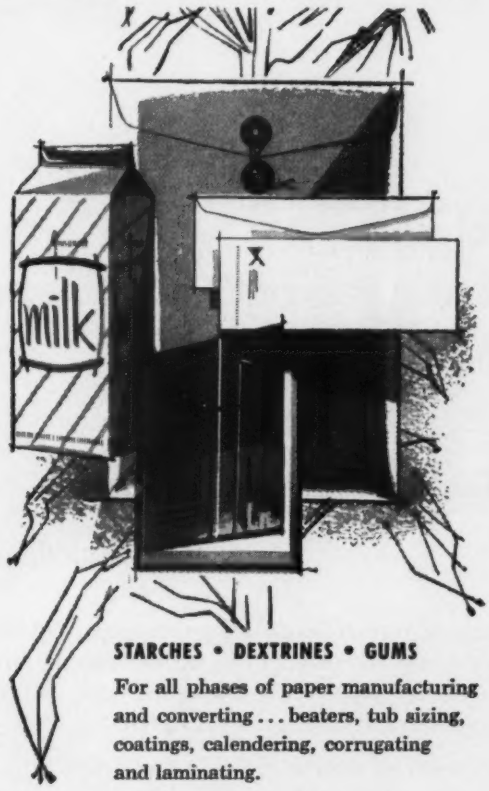
Champion P & F Co 4½%	107½	109
Champion P & F 3¾%	88	88
Diamond Gardner 4%	91¾	97
Kimberly Clark 3%	91¼	90½
Oxford 4¾%	105¼	106¼
Scott 3%	111½	109⅜

American Stock Exchange — Stocks

Allied Paper	13½	13⅛
American Writing	30¾	29
Brown Co.	13¾	14
Puget Sound	22½	22¾

*Closing Bid and Asked Prices.

Look what happened to the corn we took off the cob



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For all phases of paper manufacturing and converting . . . beaters, tub sizing, coatings, calendering, corrugating and laminating.

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A "Special" detergent for continuous washing of pickup felts

IGEPAL® CO-630

is economical, easy to apply... lengthens felt life

Because of its truly nonionic nature, Igepal CO-630 does not form insoluble precipitates with calcium and magnesium, as does soap, or anionic based detergents. This nonionic detergent is compatible with alkaline salts, acids and commonly used solvents, but contains no harmful alkalis to weaken felt.

Paper machine wet-end felts can be washed with Igepal CO-630 solutions in the usual felt conditioning units, either continuously or intermittently while running; there is a minimum of foaming action. Igepal improves drainage, is positively non-shrinking. Complete technical information supplied on request. Simply write—

From Research to Reality

GENERAL DYESTUFF COMPANY · ANTARA CHEMICALS

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SALES OFFICES: New York • Providence • Philadelphia • Charlotte • Chattanooga • Chicago Portland, Ore. • San Francisco • Los Angeles. IN CANADA: Chemical Developments of Canada, Ltd., Montreal

Igepal CO-630, manufactured by General Aniline & Film Corp., is sold outside the United States and Canada under the tradename Antarox CO-630 by distributors all over the world.

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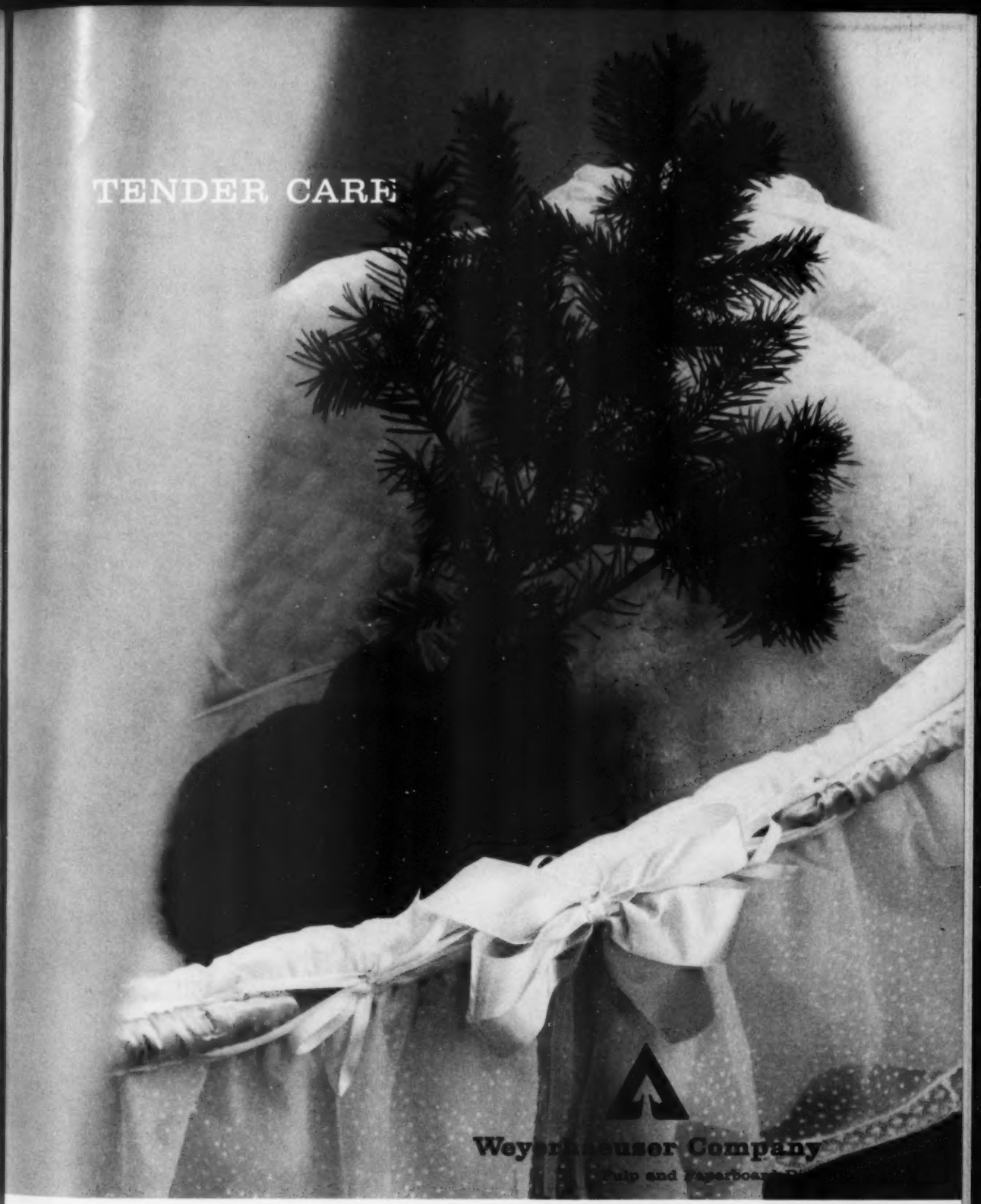
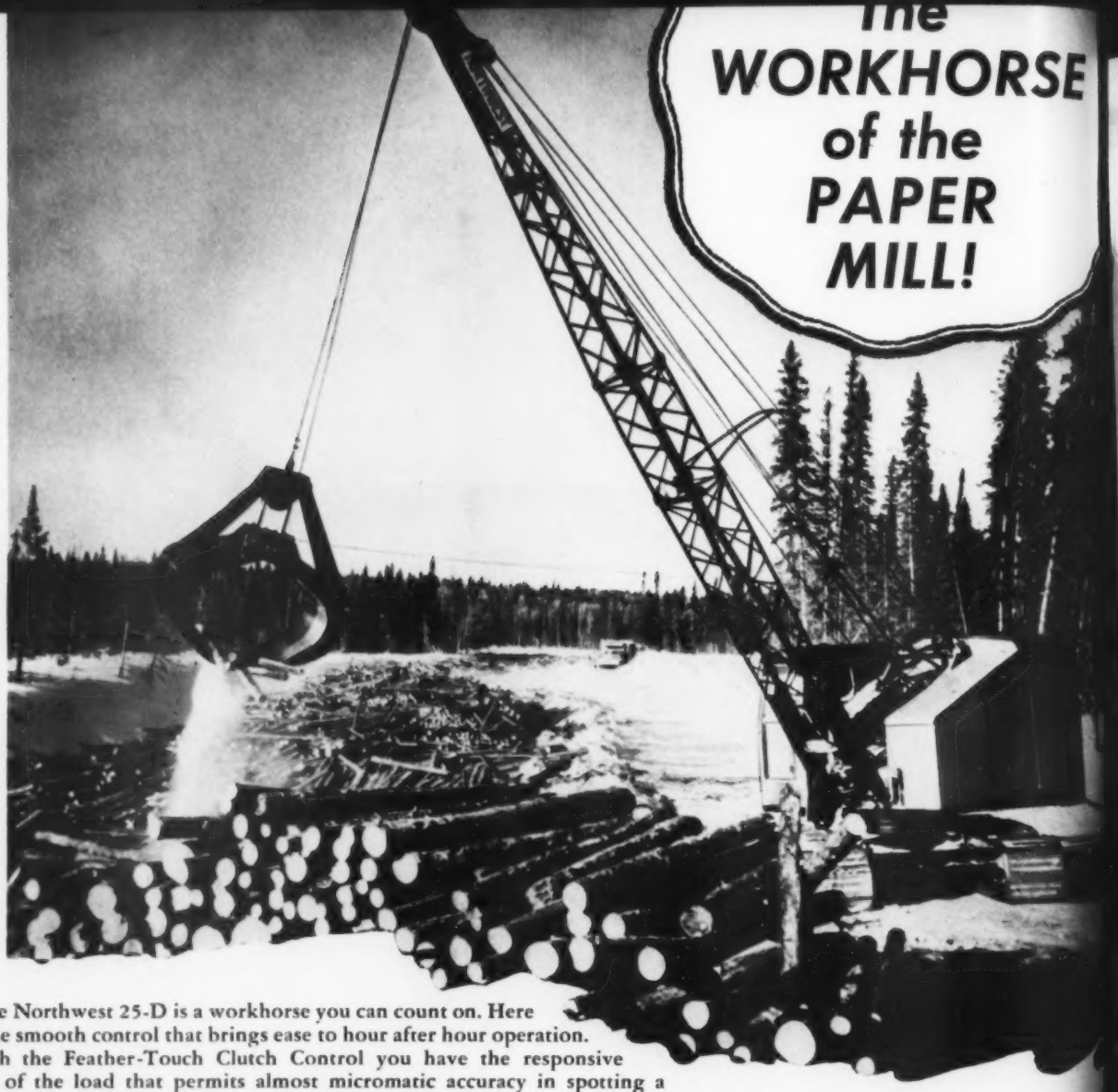


Skilled foresters at Weyerhaeuser tree farms will give expert care to this and millions of other young trees to insure an ever-increasing and continuous supply of wood pulp.

The WORKHORSE of the PAPER MILL!



The Northwest 25-D is a workhorse you can count on. Here is the smooth control that brings ease to hour after hour operation. With the Feather-Touch Clutch Control you have the responsive feel of the load that permits almost micromatic accuracy in spotting a load whether high stacking or casting to jack-straw piles.

Larger Uniform Pressure Swing Clutches give a velvet action and eliminate the jerks and grabs characteristic of band-type designs. Northwest Uniform Pressure Swing Clutches will run hour after hour without extra cooling devices or boosters.

On the Northwest 25-D you can have the Northwest Independent High Speed Worm Boom Hoist and reduce the time lost to moving. The Northwest Independent High Speed Worm Boom Hoist is unequaled for ruggedness. It is the most advanced design in boom hoist equipment. It assures continuous operation, under maximum load, without overheating or fading.

Power Load Lowering provides positive operation with a single lever for both hoisting and lowering. It can be engaged or disengaged at will, either free or under load. Gear drive and Uniform Pressure Clutches assure smooth action.

These features are just part of the many things that get the job done in the pulpwood yard. They are among the Northwest advantages that mean lower cost handling and greater safety to your crew. A finer machine will save money for you. That's why some of the leading paper producers have standardized on Northwests. Ask a Northwest man to give you the complete story.

NORTHWEST ENGINEERING COMPANY
1508 Field Building, 135 South La Salle Street, Chicago 3, Illinois
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L-25-13-L6

GEORGIA-PACIFIC PAPER COMPANY

EQUITABLE BUILDING · PORTLAND 4, OREGON

ROBERT E. FLOWERREE, JR.
PRESIDENT

July 15, 1960

Mr. F. T. Peterson, President
The Black-Clawson Company
250 Park Avenue
New York 17, New York

Dear Frank:

I am sure you know we started up our new Black-Clawson paper machine on June 15. I want to take this opportunity to tell you how pleased we are with the services that you have given us in the delivery of this equipment and also how pleased our people are with the machine itself.

It is very satisfying to have a job come out as well as our expansion program did and your company certainly played a large part in this achievement.

With my kindest personal regards.

Sincerely,

Bob

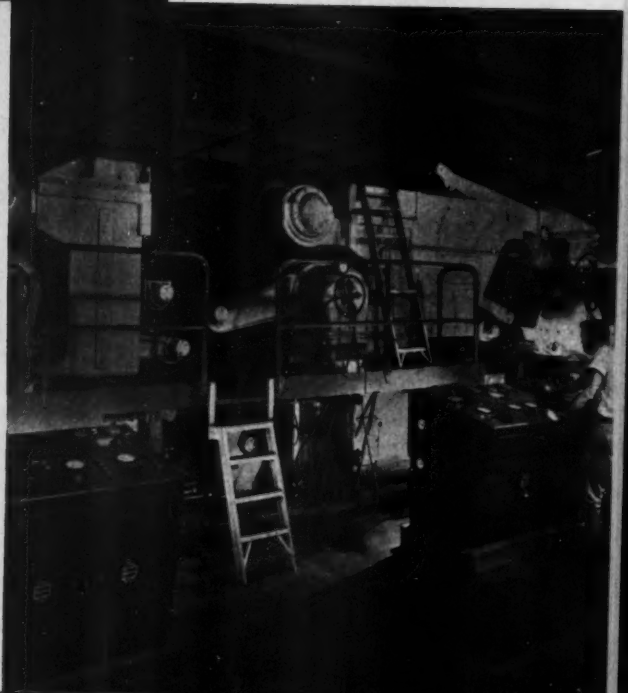
"0+5"

AT

GEORGIA-PACIFIC

Eleven and a half months from date of order this 175" Black-Clawson paper machine was started up. A saleable sheet was on the reel in just 5 minutes.

A tribute to the fine organization of Georgia-Pacific Paper Company and another example of Black-Clawson's engineering and manufacturing service to the paper industry.



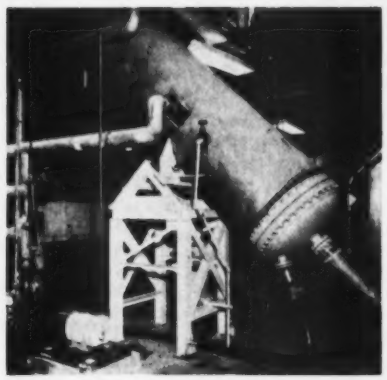
Another Advanced Engineering Design

For more data circle 117 on Post Card

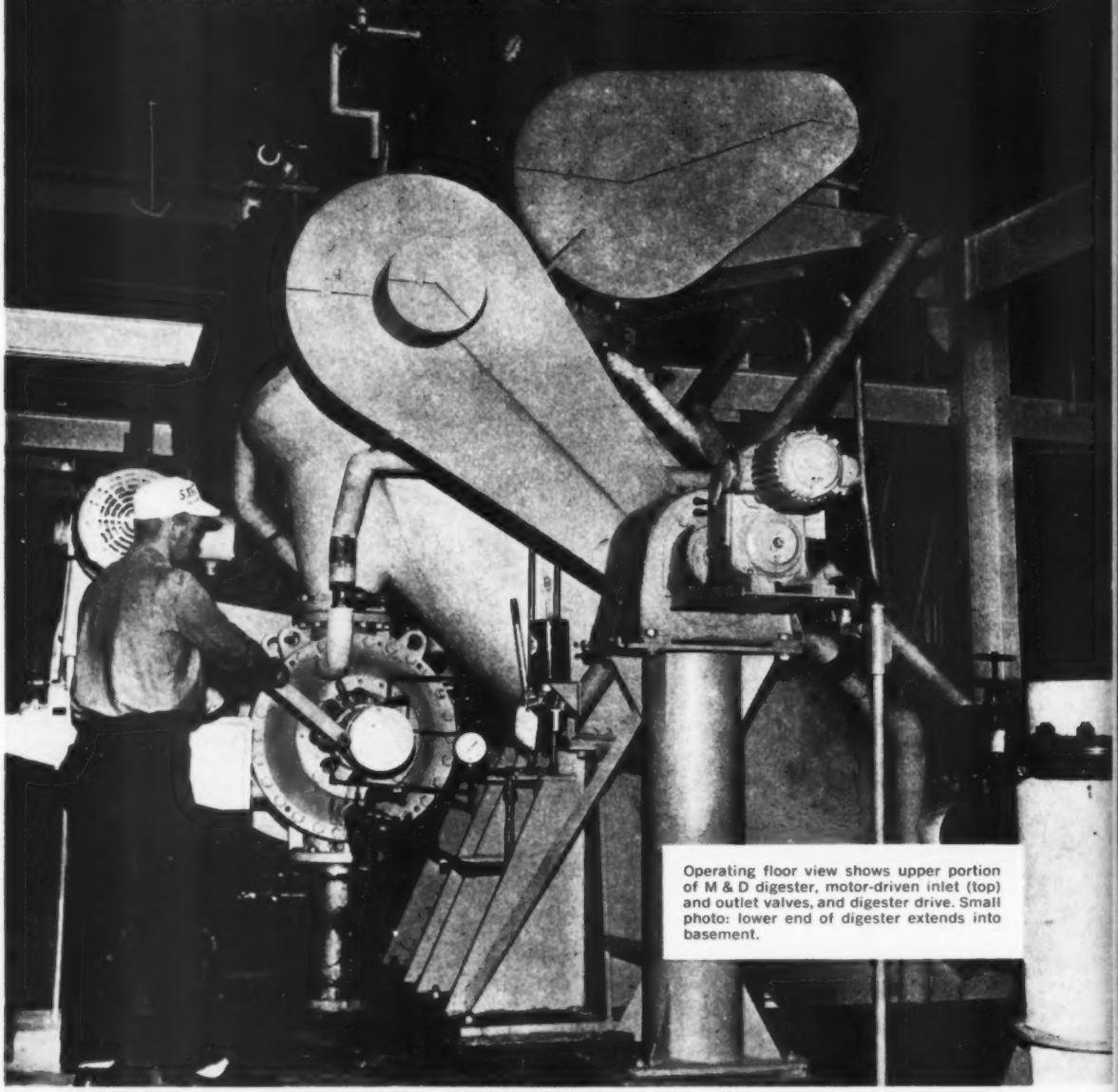
Bauer pulping and refining equipment in Blandin chemi-mechanical pulp mill

Bauer equipment plays an important role in the 4-million dollar quality improvement program at Blandin Paper Co., in Grand Rapids, Minn.

In the company's new chemi-mechanical pulp mill, chips are cooked automatically and under pressure in a Bauer M & D Continuous Digester. This inclined, space saving unit provides uniform cooking on a continuous basis and facilitates maximum efficiency of subsequent operations. These include moisture removal and preliminary fiberizing in a Bauer Pressafiner, then refining in Bauer double revolving disc refiners, final stock preparation in a Bauer Pump-Through refiner, and cleaning in Bauer Centri-Cleaners. Bauer equipment can help improve quality and production in your mill, too. Ask for details.

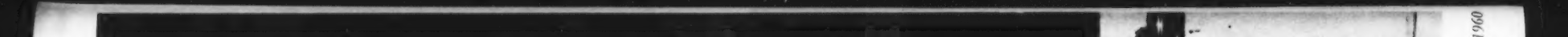


THE BAUER BROS. CO., Springfield, Ohio



Operating floor view shows upper portion of M & D digester, motor-driven inlet (top) and outlet valves, and digester drive. Small photo: lower end of digester extends into basement.

For more data circle 118 on Post Card



NEWS of the INDUSTRY

Bolton-Emerson Appointed Sales Representatives

The officials of John W. Bolton & Sons Inc. and the Emerson Mfg. Co. Division of Lawrence, Mass., have completed arrangements with Aktiebolaget Defibrator of Stockholm, Sweden, which will make the American manufacturer of stock preparation machinery the exclusive sales representatives in the U.S. and Canada for the Swedish-built Raffinator disc refiner.

The Raffinator is a product of the widely recognized Swedish skills in design and engineering and has had wide acceptance in European paper mills where nearly 700 installations have been made. The unit is noted for its precision and ruggedness of construction and its capacity for performing all types of defibrating and pump through or pressure refining at high consistency.

Unusual features of this disc-type refiner are its complete hydraulic system, which provides constant, precision control over the disc positions; its visual indicator, magnified 80 times, which permits operators to see the exact plate settings at any time; and its ability to operate with plates in a fixed position or on a floating principle which permits the movable disc to respond freely to varying stock pressures.

From left to right: A. L. Bolton Jr., treasurer and general manager, John W. Bolton & Sons Inc.; John Mladota, president of Bolton-Emerson S.A., Lausanne, Switzerland; Stig Selander, vice president; Arne Asplund, president; Rolf Reinhall, chief engineer; and Olav Naslund, general manager, all of Aktiebolaget Difibrator.

Technical Studies Conducted by Wisconsin Wire

Wisconsin Wire Works is conducting a series of cooperative meetings with mill representatives in the paper industry.

D. E. Jones, paper superintendent of St. Regis Paper Co., Pensacola, Fla., is the first guest attending a new series of cooperative technical studies by Wisconsin Wire on the manufacture of fourdrinier wires. Jones spent several days in June at the company's home plant in Appleton, Wis.

Left to right: James Schmidt, supervisor for Wisconsin Wire Works' Drawing Dept.; Horace B. Hill Jr., Southern representative for Wisconsin Wire Works; and D. E. Jones, superintendent of St. Regis Paper Co., Pensacola, Fla.

During this period, the intricacies of the preparation of the raw material through the wire drawing department to the final weaving and finishing processes involved in the manufacture of a fourdrinier wire were explained and demonstrated in detail to Mr. Jones. Discussion and exchange of ideas and experiences between Jones and technical specialists of the Wire Works were also an important part of the visit.

According to James E. Watson, president of Wisconsin Wire Works, these cooperative technical studies and discussions, which cover all phases of operation at the wet end of paper machines, as well as the peculiar needs of each individual machine and mill, are extremely important to the company's efforts in producing improved fourdrinier wires, both for better paper formation and longer wearing life.

Wisconsin Wire is conducting a series of such cooperative meetings with other mill representatives of the paper industry.

Patents Issued to Jamesbury

U. S. Patents covering the manufacture of "Double-Seal" ball valves were issued to Jamesbury Corp. of Worcester, Mass.

Jamesbury is now fabricating its unique "Double-Seal" valve in a variety of sizes and materials for both industrial and military use. The valve gets its name from the plastic seats and seals that are positioned on either side of the channeled ball within the valve.

Problems Of Pulp And Paper Industry To Be Discussed At Tokyo

The problems of developing a larger pulp and paper industry in the countries of Asia and the Far East will be considered later this year at a United Nations conference to be held in Tokyo from October 17 through 31.

The conference will be sponsored by the UN Economic Commission for Asia and the Far East (ECAFE), the UN Bureau of Technical Assistance Operations and the Food and Agriculture Organization. Tokyo was chosen as the site of the conference at the invitation of the Japanese Government.

Government representatives, industrialists, research specialists, forest experts and equipment manufacturers will be brought together at this conference to concentrate on how best to overcome some of the obstacles now

impeding the setting up of economically sound paper mills in the region where paper consumption is far below the world average.

Cochrane Changes Milwaukee Address

Cochrane Corp. of Philadelphia, Penn., has announced the relocation of the Milwaukee Branch office to 2411 W. Capital Drive, Milwaukee 6, Wis. Manager of this branch office is Norman J. Blais. He is assisted by Frederick N. Lowe.

University of Maine Receives $30,000

A gift of $30,000 from the Louis Calder Foundation has been received by the University of Maine. It has been planned that $20,000 of this gift will be used for a scholarship program over a period of eight years. The balance will be used for the support of the teaching of chemical engineering, particularly pulp and paper technology.

New Address for Crane Co.

Effective August 1, 1960, Crane Co.'s executive office address was changed to 155 N. Wacker Drive, Chicago 6, Ill. Tel: STate 2-1580. The company's former address was: 836 So. Michigan Ave.

Industrial Bag & Cover Association Celebrates 10th Anniversary

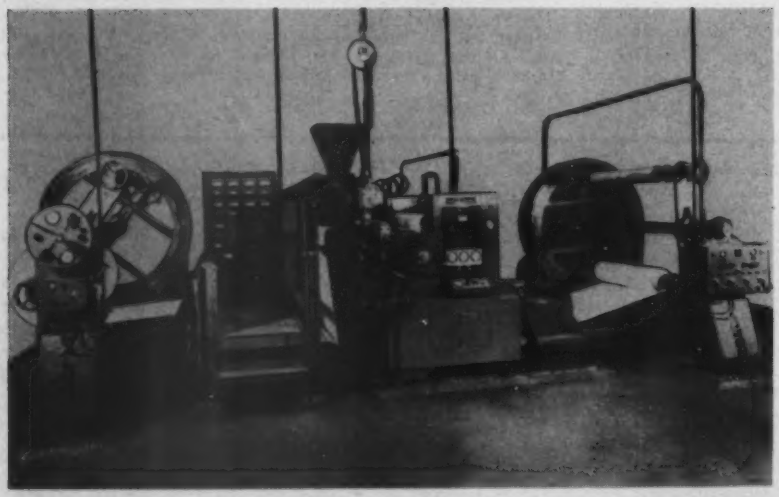
The Industrial Bag and Cover Association's 1960 Annual meeting marked the 10th anniversary of the founding of the Association and was highlighted by a testimonial dinner tendered Managing Director Deitsch by members of the Association.

"A Tribute to Philip O. Deitsch" was the theme of the Association's dinner. Deitsch was presented with a pictorial montage illustrating his ten years of service as director of the association.

Deitsch was re-elected as the group's managing director and William V. Driscol was designated as the group's administrative officer. A. L. Park, manager of the Paper Specialty Division of Bemis Bro. Bag Co. was elected president of the association and E. H. Look, vice-president of Portco Corp. was elected vice president.

Recent Expansions in the Industry

Marvellum Installs Extruder-Coater



A new 54-in. polyethylene extruder-coater has been installed at the Marvellum Co. in Holyoke, Mass. This equipment will enable Marvellum to supply many types of extrusion coatings and laminations in addition to its present line of military packaging materials.

The machine line (designed especially for Marvellum by the Waldron-Hartig Division of Midland-Ross Corp.) consists of a rotating unwinder, splicing section, Hartig extruder and 60-in. die, Waldron coater-laminator, slitting section, and rotating winder for continuous operaton. The unit features running adjustment of the distance between the die and coating nip for optimum control of bond and heat-sealability.

This installation marks the completion of Marvellum's current $500,000 modernization and expansion program.

Super Structure Conveyor Being Built for Certain-Teed

Photo at right shows a new type of super structure conveyor which is now being assembled for installation at the Richmond, Va., plant of Certain-Teed Products Corp.

Manufactured by Arwin Engineering & Machinery Co. of St. Louis, Mo., this new-type conveyor is 22 ft. in height with conveyance distance of 65 ft.

The conveyor has been designed for handling bulk or heavy materials and is said to be capable of handling 300 bales of paper from 1,300 to 1,500 lbs., each, per hour. Certain-Teed will use this unit for handling heavy, bulky paper product materials including baled paper.

View of Georgia-Pacific's expanded Toledo, Oregon paper mill.

Georgia-Pacific Dedicates Second Half

Shown at the left is Secretary of State Howell Appling Jr. as he scissored a huge kraft paper ribbon. This was the official opening of the new expansion. Standing at the right is William Shelton, manager of the new Toledo plant.

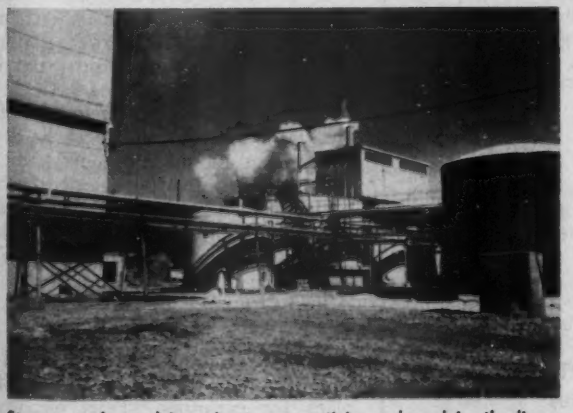
Leading the tour were (from left to right) Robert E. Flowerree, president of G-P Paper Co.; Carrol Shanks, director of G-P Corp. and president of Prudential Insurance Co.; Harvey Fruehauf Sr., G-P director and formerly chairman of Fruehauf Trailer Co.; Stewart Hawes, G-P director and president of Blyth & Co. Inc. (behind Fruehauf); and William Shelton, G-P Paper Co. vice president and resident manager at Toledo, Ore.

Secretary of State Howell Appling recently scissored a brown kraft paper ribbon at the plant site of Georgia-Pacific Paper Co.'s Toledo, Ore., mill —officially opening the second half of this mill. Other industry officials joined in the dedication of the newly completed second half of the company's $25-million kraft paper mill.

Completion of this addition, in less than 2½ years since the plant's opening, has doubled the Toledo paper mill's production and payroll. This construction was part of a $6-million expansion program which began in 1954 by the parent company, Georgia-Pacific Corp. to expand facilities in its 27 plants from coast to coast.

Toledo's two paper machines now produce 600 tons daily, from 30-lb. paper to 69-lb. container board. The new machine trims to 160 in. and produces kraft paper from wrapping, shopping bags, multi-wall bags and numerous other products. The original machine trims to 240 in. and produces the heavier containerboard, used primarily in cartons and other packaging.

Wood chips from waste wood are supplied from Georgia-Pacific plywood



Storage tanks used in series to re-causticize and re-claim the liquor used to cook chips.

Intricate pipe maze feeds live steam to Georgia-Pacific paper machine.

and lumber plants in Oregon. Brought from the chip pile by conveyor belt to the digester, the chips are reduced to the kraft pulp from which the paper products are made.

To prevent stream pollution, G-P has spent over $1 million constructing two 7½ mile-long pipelines to carry plant effluent over 1000 feet out into the Pacific Ocean.

To assure a year-around water supply, G-P has also erected a 70-ft. dam on Olallie creek, impounding water for dry periods and creating a 100-acre fresh water lake which serves as a recreational and fishing area. The Toledo Mill utilizes upwards of 7,000,000 gal. of water daily.

The key administrative personnel at the Toledo mill are as follows: W. J. Shelton, vice president and resident manager; Edward E. Archibald, technical manager; Frank X. Kreiling, production manager; Alan D. Anderson, plant engineer; W. H. Youngchild, paper mill superintendent; William Ross, pulp mill superintendent; Harold W. Gillaspie, mechanical superintendent; Roy R. Wiberg, technical superintendent; C. Edward Taylor, assistant paper mill superintendent; James Esselman, assistant pulp mill superintendent; Wilmer Page, personnel manager; A. H. Jones, controller.

New Tool for Forest Fire Control

West Virginia Pulp & Paper Co. has acquired a light plane equipped for precision water bombing of forest fires.

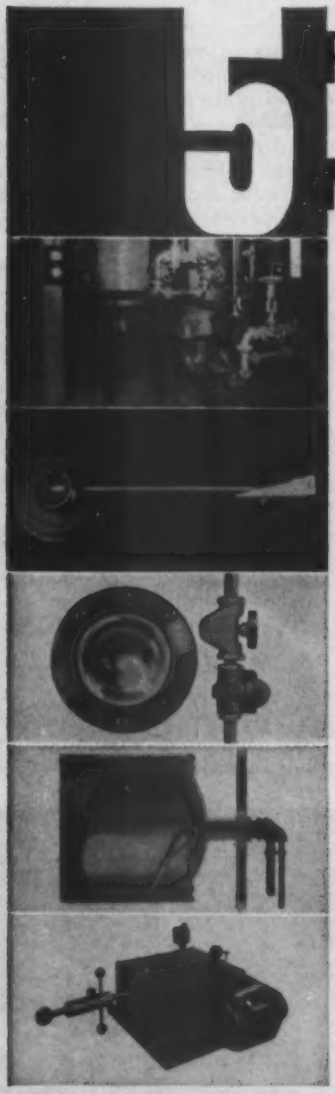
This plane is said to be designed to fly close to the ground at low air speeds and supplements other modern fire-fighting equipment on the company's 300,000 acres of woodlands.

The plane is a Stearman Trainer—a type used by the government in World War II. It can be completely rebuilt for fire fighting. The engine has 600 hp., and the wings have been redesigned to provide greater lift and maneuverability. A water tank occupies the front cockpit space and carries a 250-gal. pay load of water mixed with a chemical wetting agent. Precision bombing puts out small fires and keeps bigger blazes from spreading and running out of control.

A two-way radio communications between the plane and fire fighters on the ground are used to coordinate the company's fire-fighting efforts. Based on reports from the pilot as to the direction, intensity and characteristics of the fire, effective measures can be developed for control and containment. Ground forces are also protected from being cut off or trapped by a fire since the pilot takes the guesswork out of predicting the path of a blaze.

Allied Chemical Begins Second Expansion at Brunswick

The Solvay Process Division of Allied Chemical Corp. has announced plans for expansion of its mercury cell, chlorine-caustic soda plant at



5 PROFIT MAKERS for the MODERN PAPER MILL

Ross Midwest Fulton Dryer Drainage Systems

Pays for itself in steam savings alone. Also increases production from 10% to 30% and improves quality of the sheet.

The Cowie Scraper

A proven condensate removal device for rotating dryers. Condensate film is reduced to a minimum, higher heat transfer, lower evacuation differentials, lower steam consumption.

Ross Midwest Ball Sight-Flow Indicators

Self-cleaning, front and side visibility, may be installed either vertically or horizontally, you know what's going on inside the dryer.

Ross Midwest Auto-Flex Syphon

The most dependable syphon, fits any syphon type dryer, always maintains proper clearance, no adjustments, minimum maintenance.

Hydroscillators for Rewinders

Eliminates wrinkles and hard and soft spots on the roll. Here's the key to less loss at the finished end.

Write today for more information on these 5 ROSS MIDWEST FULTON *Profit Makers*

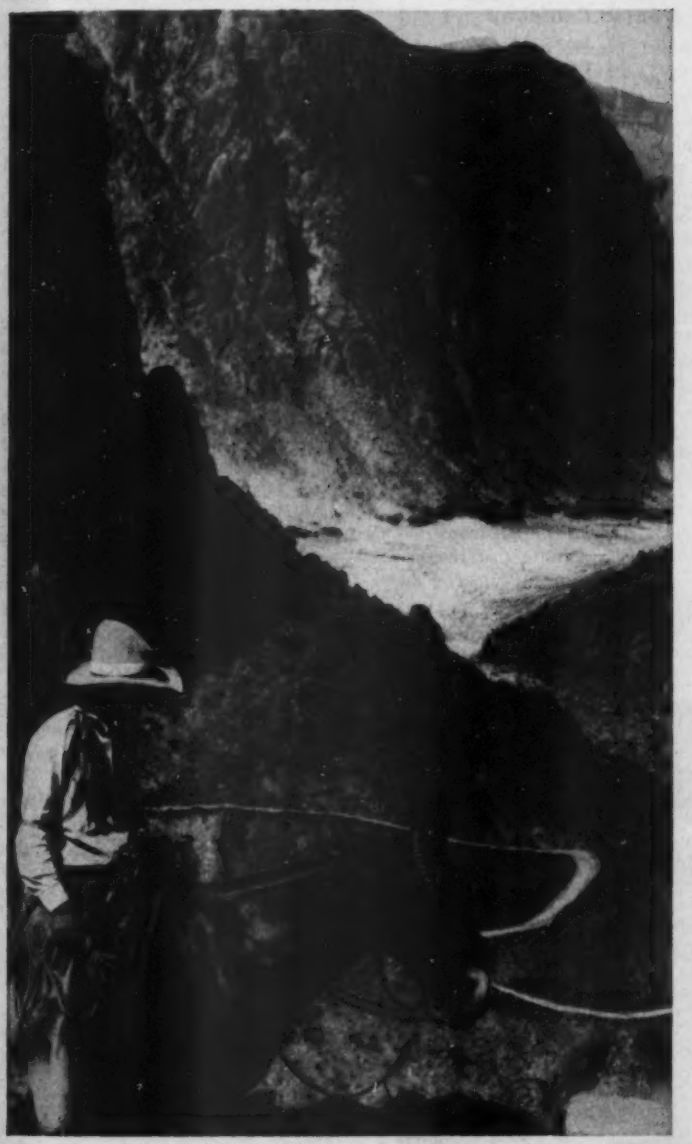
ROSS MIDWEST FULTON
A Division of Midland-Ross Corporation
Box 846, Dayton, Ohio

For more data circle 119 on Post Card

Famous Burro Trail Down Into Grand Canyon

*Idea submitted by R. D. Jacobs, 3006 Burge Ave., Hopewell, Va.

Photo by: H. Armstrong Roberts



HAM FELTZ says:

"Reminds me of HAMILTON Felts... the trail to increased profits!"

"To increase their enjoyment of the awesome spectacle of the Grand Canyon, many visitors take this trail to the Canyon floor.

"Reminds me that papermakers who order Hamilton Felts take the *right* trail to increased profits."

Hamilton Felts run water like a sieve. They're "water-conditioned" for fast water removal, so they deliver drier sheets to the drier, permit operators to run machines at higher speeds with fewer stops, less broke. Results for you: less downtime, more tonnage, more profits.

If one of our 300 modern, technically proven styles won't solve *your* specific problem, we'll be happy to design a Hamilton Felt that will. Just ask your Hamilton Felts Service Salesman.

*WIN... *A NEW Shakespeare Spincast Fishing Outfit!*

"What famous place reminds you of Hamilton Felts? Tell us why in a few words; sign your name and address and name of company. Each month, the idea from a papermaker that we use wins a new 1960 model Shakespeare Spincast Rod and Reel—FREE! When identical winning ideas are submitted by 2 or more papermakers, the one with the earliest postmark will be considered the winner. *Every U.S. papermaker entrant* receives a famous Rex Spoon fishing lure—FREE. Send me your suggestion—today. Ham Feltz, 612 First National Bank Bldg., Cincinnati 2, Ohio."

YOU CAN'T BEAT

Hamilton

FELTS

SHULER & BENNINGHOFEN, HAMILTON, OHIO

For more data circle 120 on Post Card

Brunswick, Ga. This is the second expansion of the Brunswick plant since it was constructed in 1956.

New facilities will increase chlorine-caustic soda production capacity by approximately 100 tons per day.

Solvay also has chlorine-caustic soda facilities at Syracuse, N.Y.; Baton Rouge, La.; and Moundsville, W. Va.

Humphrey Buys Allis-Chalmer's Manlift Elevator Product Line

Humphrey Elevator Co. of Faribault, Minn., has completed the purchase of the manlift elevator product line from Allis-Chalmers Mfg. Co. of Milwaukee, Wis.

A. B. Morris, president of Humphrey, declared: "Our acquisition of the capital assets and good will of the Allis-Chalmers elevator product line includes the patterns for the "Nordyke" and "Marmon" manlifts. Spare parts for these will henceforth be made and supplied by us. The Humphrey manlift elevator will remain our prime product".

In 1887, Humphrey pioneered the original manlift elevator. They are now widely used in all types of multi-story factories, parking ramps, grain elevators and mills, including flour mills, paper and pulp mills, and chemical plants.

Newly Formed Company

A newly formed company to be known as Paper Tubes Inc. has been established in Buffalo, N.Y. This is the first firm in the area to go into large-scale production of tubes for various purposes. The firm has offices at 748 Washington St. and a plant at 240 Scott St.

Before the company started operations on June 1, local firms purchased tubes in either New York City or Cleveland. The tubes to be manufactured by this firm can be made to any diameter or length. They will be produced on specially designed, tube-winding machinery.

Ground-breaking for Chemical Gypsum Plant

Allied Chemical's Barrett Division has broken ground for the construction of the first plant to manufacture gypsum board chemically instead of from gypsum rock.

Gypsum will be made from a by-product of phosphoric acid. The new Barret process is said not only to make gypsum identical to that made from natural ore, but to allow for better control of the board's quality. During ground-breaking ceremonies, industrial leaders witnessed a demonstration in which a blow torch was used to show the chemical gypsum's fire-retardant qualities. Chemical panels showed the same resistance as panels of "natural rock" gypsum.

The plant will be located in Claymont, Del., and is said to be a multi-million-dollar undertaking. Required ingredients will be supplied by Allied's Chemical Division located adjacent to the projected Barrett plant.

Halifax Adds New Facilities

Halifax Paper Co. of Roanoke Rapids, N.C., has announced plans for the construction of additional facilities to its mill.

New additions will consist of two new digesters, a pulp washer, a lime kiln and certain other auxiliary equipment. The lime kiln will assist in maintaining stream sanitation in the Roanoke River, in that the lime slurry which is presently discharged to the river will, upon completion of the kiln, be burned and reused in the pulp mill. In addition, there will be improvements in the causticizing system.

This expansion, is said to increase the total rated pulp production capacity of the plant from its present 740 tons to 800 tons per day. The added equipment will also permit the simultaneous pulping of hardwood and pine. It is presently planned that daily pulp production will consist of 725 tons of pine, plus 75 tons of hardwood.

Columbia Cellulose To Build Research Facilities

Columbia Cellulose Co. will get underway immediately in the building of new research facilities adjacent to its Prince Rupert pulp mill.

Dr. J. W. Wilson, director of the Research & Development Division, stated that the new laboratory will provide research and development facilities for both the Prince Rupert and Celgar pulp mills. The new facilities will give greater flexibility of operation and permit greater co-ordination of related research activities.

The new building takes the form of a single, two-story, concrete-frame structure 13,940 sq. ft. in area. It will contain pilot plants, laboratories and administrative facilities. Services will be drawn from the pulp mill through a covered trench 250 ft. in length.

For more data circle 121 on Post Card

Coming Events

TAPPI

October 17-19 — 15th Plastics-Paper Conference, Hotel Syracuse, Syracuse, N.Y.

October 23-27 — 15th Engineering Conference, Robert Meyer Hotel, Jacksonville, Fla.

PIMA

October 14-15 — Michigan Division, Dearborn Inn, Dearborn, Mich.

November 15 — Miami Valley Division, Manchester Hotel, Manchester, Ohio.

November 16 — Michigan Division (joint meeting with TAPPI), Hotel Harris, Kalamazoo, Mich.

December 1-3 — Pacific Coast Division (Annual Fall Meeting), Hotel Multinomah, Portland, Ore.

January 12 — Connecticut Valley Division (Winter Meeting), Publick House, Sturbridge, Mass.

January 19 — Michigan Division (Annual Papermakers Get-Together Party), Hotel Harris, Kalamazoo, Mich.

February 9 — Michigan Division, Hotel Harris, Kalamazoo, Mich.

OTHER MEETINGS

October 17-21 — 48th Annual National Safety Congress, Pick-Congress, Chicago 11, Ill.

October 17-31 — Conference on Pulp and Paper Development in Asia and Far East, Tokyo.

October 19 — Fall Meeting, Great Lakes Section Forest Products Research Society, Manger Rowe Hotel, Grand Rapids, Mich.

October 23-27 — Canadian Institute of Forestry and the Corporation of Forest Engineers of the Province of Quebec (joint forestry convention in Quebec City.

October 24-25 — Maryland Division of Society of Packaging and Handling Engineers (6th Annual Eastern Industrial Packaging and Handling Show, 5th Regiment Armory, Baltimore, Md.

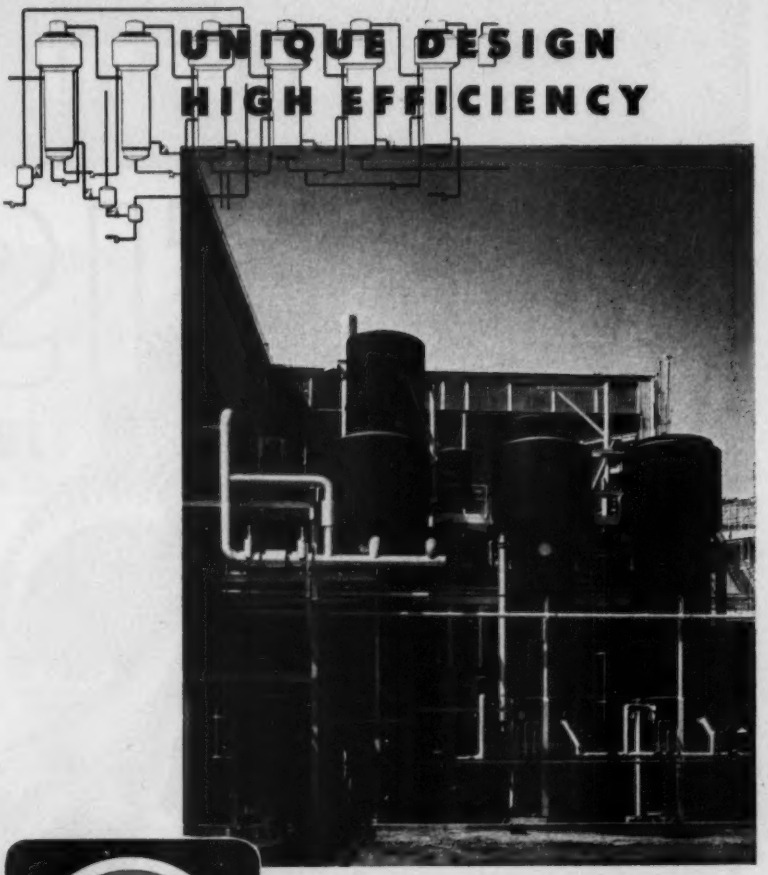
October 26-28 — 3rd Cellulose Conference, Cellulose Research Institute, State University College of Forestry, Syracuse, N.Y.

October 31-November 3 — Semi-Annual convention of NPTA for 1961, Conrad Hilton, Chicago, Ill.

November 1-3 — Material Handling Institute Central States Show, Kentucky Fair & Exposition Center, Louisville, Ky.

November 13-15 — Joint Pacific Coast Conference, sponsored by Institute of Scrap Iron & Steel and the National Association of Secondary Material Industries, Beverly-Hilton Hotel, Los Angeles, Calif.

November 28-December 2 — 24th National Exposition of Power & Mechanical Engineering, New York Coliseum, N.Y.



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BLACK LIQUOR EVAPORATOR at NEW SOUTHERN PAPER MILL

This six body, sextuple effect evaporator system was installed in a U-shaped arrangement and was designed to concentrate 428,000 lbs. of black liquor from 14 per cent to 50 per cent solids content, when supplied with 56,000 lbs. per hour of 45 psi steam. The high efficiency of this system (5.52 lbs. of water per pound of steam) was made possible through a new and novel feed arrangement into the evaporators. The first effect evaporator is equipped with 2 inch diameter stainless steel tubes while the other five have welded seam carbon steel tubes.

For more detailed information write for bulletin #PP 509-1

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NAMES in the NEWS

Crown Zellerbach Corp.

Gus Ostensen, resident manager of the company's Antioch, Calif., mill division since 1955, has been appointed production manager of Crown Zellerbach Corp. International.

Succeeding Ostensen as Antioch resident manager will be John M. Miller. Miller was previously serving as assistant resident manager since January 1959.

W. O. Beaton has been appointed to assistant resident manager of the Bogalusa, La., pulp and paper mill division.

Clarence E. Englund has been appointed to resident manager of the Lebanon, Ore., mill division.

John J. Goss has been appointed as assistant resident manager of the Camas, Wash., mill division.

D. R. Schmidt will rejoin the company's corporate headquarters in San Francisco as an executive in the company's recently established International Division. He joined the company in 1948 and was secretary of the company from 1954 until he took over his assignment in British Columbia in 1957.

Robert G. Rogers of Montreal, vice president of Cooksville-Laprairie Brick Ltd., will succeed Schmidt in Vancouver. Rogers also becomes a vice president of Crown Zellerbach Canada.

D. C. Stahle, former manager of Tetra Pak Packaging for C-Z at San Francisco, has been named manager of Dair Packaging for the firm's Western-Waxide Division at San Leandro. In his new post, he will report to Western-Waxide Division headquarters in San Leandro.

John C. Plankinton, former resident manager of C-Z's Western-Waxide Division packaging plant at St. Louis, has been named assistant resident manager of the firm's new carton plant operations in St. Louis.

R. R. Jorgensen, Kansas City resident manager, will assume Plankinton's former post as assistant resident manager of the packaging plant in St. Louis. This move is part of the consolidation of Kansas City and St. Louis flexible packaging operations which was announced earlier this year.

G. Ostensen

J. M. Miller

E. K. Scholz

W. D. Major

D. R. Schmidt

T. C. Bannister Jr.

Bowaters Corp.

T. C. Bannister Jr. has been appointed a vice president of the company. He will continue as general manager of Bowaters Carolina and will have responsibility for day to day control of all existing and planned operating units at Catawba. He is also a director of Bowaters Carolina; Catawba Timber Co., the Carolina woods organization; and Bowaters Southern Paper Corp. of Calhoun, Tenn.

Lowell Culbertson, acting mill manager of Bowaters Southern Paper Corp., has been promoted to mill manager.

Joseph O. Evans, formerly assistant industrial relations manager of Bowaters Southern Paper Corp., has been promoted to personnel manager.

West Virginia Pulp & Paper

E. K. Scholz, pulp mills department superintendent at the Bleached Board Division, has been appointed to the additional responsibilities of recovery department superintendent.

Dr. William D. Major, assistant technical director, has been appointed technical director at Westvaco's plant in Covington.

LaVerne B. Paulsen has been appointed as project manager on the manufacturing services department of the Hinde & Dauch Division. He will coordinate special projects among the division's engineering services, technical, production, sales and product development departments.

J. Frank Greeley has been named Western district sales manager for the Multiwall Bag Division. He will make his headquarters at the company's Torrance, Calif., plant. He will succeed Frank L. Smith who has resigned to accept a position with another firm.

S. E. Fogelberg

O. G. Traczewitz

International Paper Co.

S. E. Fogelberg, chief forester for the company since 1942, is retiring after more than 40 year's experience in forestry and forest land management — 18 of which were spent with International. He is a native of Sweden and a graduate of the Royal Forest Institute in Stockholm. For five years, he was a partner in Forest Managers Inc. of Jacksonville, Fla. Before joining International, he was general manager of the Southeastern operations of the Southern Resin & Chemical Co.

O. G. Traczewitz, currently assistant chief forester for the company,

CAMPCO LOG BARKER

Exclusive Fluid Drive — for Hard or Soft Wood

Quick, thorough bark removal, with all operations controlled from central station at either end of machine. One prime mover—electric motor or gas or diesel engine—provides all power requirements. Logs turned by bull wheels with special Mapco Taper Wedge Locks which permit quick, easy relocation for logs of various lengths.

Standard models are for logs 5"—36" diameter and lengths of 20', 24' and 26'. Special models available for West Coast hardwood and veneer logs up to 55" diameter and 30' lengths.

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CARTHAGE, N. Y.

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Names in the News . . .

will assume Fogelberg's duties. He joined International in 1941 as a timber cruiser in Sheridan, Ark., and in May 1960 he became assistant chief forester. He will now advise on all policy relating to the use, protection, management and acquisition of timberland for the company's Southern Kraft Division.

James E. Nicholas, a civil engineer with the Southern Kraft Division, has been named division civil engineer. He will return to Mobile from Longview, Wash., where he has been a construction engineer for the company's Long-Bell Division since May 1959.

Texas Gulf Sulphur Co.

Dr. Guy T. McBride Jr. has been elected as vice president of the company. After having acted as a chemical engineering consultant to the company for several years. McBride joined the company in 1958 and was named manager of the research department a year later.

Ira E. McKeever has been appointed as general manager of sulfur operations of the company. He will be headquartered at Newgulf, Texas, and will have direct charge of the sulfur operations at all locations in the Gulf Coast region.

Jefferson Chemical Co. Inc.

James V. Daniels has recently been appointed salesman for the company's Eastern Region. Daniels was previously employed by Shell Oil Co.

J. E. Sirrine Co.

H. Wells Meakin has been elected vice president in charge of the pulp and paper division of the company. He has long been associated with the chemical and the pulp and paper industries having been on the staff of Sirrine since 1928 and has been associated with the design of many paper mills.

Continental Can Co.

Joseph W. Gary has been named manager of the corrugated box plant in Tyler, Texas. He has been with the company for nine years and has been superintendent at Tyler since the plant began operation in 1958.

Edgar O. Olsen Jr. has been appointed corrugated box district sales manager in Tyler. For the past eight years he has been a corrugated box salesman.

Roger Geartz has been promoted to manager of the corrugated box plant in Cleveland. He replaces F. W. Locke, who has resigned. In this new capacity, Geartz will also be responsible for the operations of the firm's corrugated box plant in Plymouth, Mich.

Nekoosa-Edwards Paper Co.

John Olewine has been named assistant superintendent of the Nekoosa paper mill. Olewine, who assumed his new duties August 1, has been with the company since October 1959 as manufacturing project engineer, working with managers of both the Nekoosa and Port Edwards mills.

A. E. Staley Mfg. Co.

Richard E. Schuman has been appointed as manager of operations and planning in the research division of the company. His duties will include research division financial and organization planning, and administering service functions of the company's new research center now nearing completion at Decatur.

George A. T. Moore has been appointed as assistant manager of paper sales. He became a senior salesman

in 1952 and served successively as assistant manager of Staley's Philadelphia and Chicago offices. Last year he was made administrative sales assistant of paper sales.

Eldred K. Olson has been named chief chemist of the company's quality control laboratory. He will succeed Lisle R. Brown who retired September 1 after 36 years with the company.

Kenneth C. Damp has been named as a paper technical sales representative. Prior to this new position, he worked as a chemist in the Paper Section, Application Research Department.

Container Corp. of America

L. Baxter Chamberlain has been appointed general manager of the company's Lake Shore paperboard mill in Chicago. For the past two years Chamberlain has been assigned to Container's subsidiary, Europa Carton AG in West Germany.

David G. Cummings has been named general manager at the Fresno, California plant. Previously Cummings was administrative assistant in charge of all corrugated plants west of the Rocky Mountains.

Frederick C. Meyor has been appointed as general manager of the firm's Boyle Avenue folding carton plant in Los Angeles, Calif.

William B. Whiting has been appointed as division general manager and will be responsible for Container's Philadelphia and Chattanooga paperboard mills.

Gordon L. Campbell has been appointed as assistant sales manager of Container's Santa Clara, Calif., folding carton plant.

Herbert C. Clayton has been promoted to assistant sales manager for Container's Fort Worth, Texas, corrugated shipping container plant. He was formerly a packaging engineer.

National Gypsum Co.

Colon Brown has been elected as vice president in charge of corporate development. He will succeed William M. North who has been promoted to president of the American Encaustic Tiling Co. (National Gypsum ceramic tile subsidiary headquartered in Lansdale, Pa.) Brown will report to Melvin H. Baker and will be in charge of activities dealing with long-range planning, coordination of subsidiaries, corporate development and acquisitions.

Bemis Bro. Bag Co.

Addison M. Smith, cost analyst for the western operations of the company, has been appointed assistant to the president of the company. He will move to the office of the president in Minneapolis. He was office manager for Bemis in St. Helens in Vancouver, Wash., before becoming western operations cost analyst in 1956.

Oxford Paper Co.

Edward R. Frisby has been appointed to the position of vice president, industrial relations. In 1957 he was promoted to manager of industrial relations for the overall company and transferred to Oxford's executive offices in New York City where he will continue to be located in his new position. He is also currently vice chairman of the Industrial Relations Committee of the American Paper and Pulp Association.

Scott Paper Co.

Alfred J. Karpinski has been selected for the newly created position of production project manager on the staff of Paul C. Baldwin, vice president of manufacturing, engineering and research for the company.

KVP Southerland Paper Co.

Rudolph C. Germanson has announced his retirement as of August 31 from the KVP Division of KVP Sutherland Paper Co. He joined the company in 1941 as a research chemist. He played an important part in

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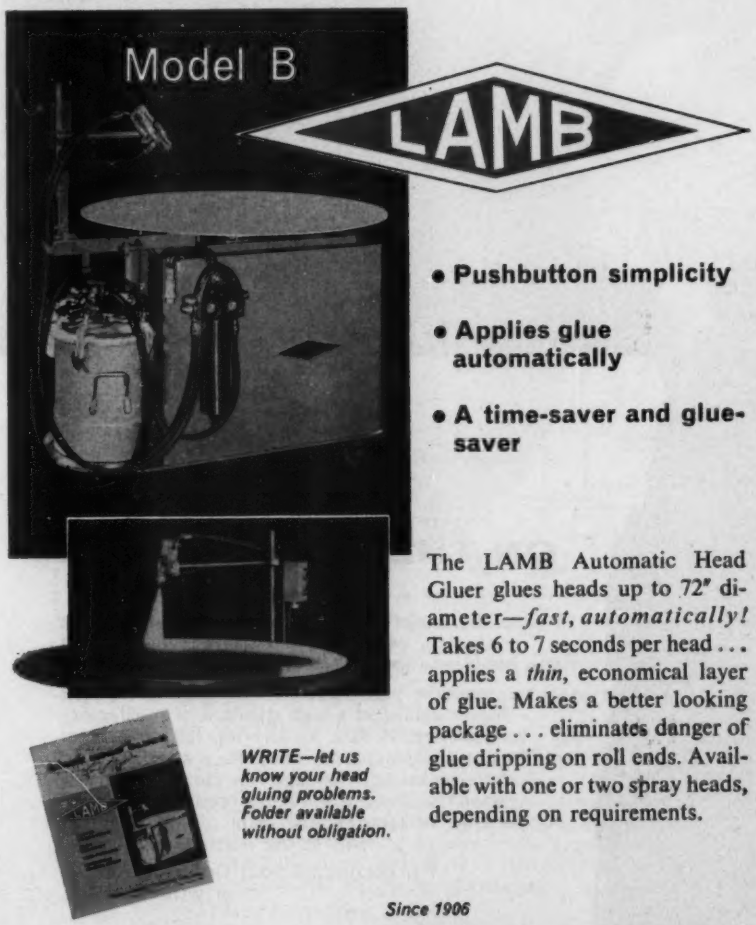
AUTOMATIC Head Gluer



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getting KVP's Espanola pulp mill ready for its first marketable pulp run in early 1946. For several years and until his recent transfer to KVP's sales division as technical consultant to the vice president of sales, Germanson was supervisor of the laboratory's mill technical service.

Thomas Flanagan has been appointed as technical director of the Sutherland Division and Cobe Jager as Wax Division superintendent of the KVP Division. Prior to his new appointment, he had been superintendent of the KVP's Wax Division since March 1959.

David L. Brew has been appointed as research engineer. He is a recent graduate of the School of Paper Technology, Western Michigan University.

James J. Matousek has been appointed as a research engineer. He is a recent graduate of the Michigan College of Mining & Technology.

Diamond Chemical Corp.

Calvin F. Lloyd has been promoted to president of the Gardner Division, succeeding Richard L. Siegel who has resigned to take an executive position with a pulp and paper manufacturer. When Gardner merged with the Diamond Match Co. in 1957 to form Diamond Gardner Corp., Lloyd was named divisional controller, the position he held until becoming assistant to the president last year.

Nekoosa-Edwards Paper Co.

John O'Brien has been named manager of manufacturing for the Potsdam mill. In his new position, O'Brien will be responsible for all paper machines, finishing and shipping operations as well as production and quality control.

The company also announced that the responsibilities of Charles Sigvardt, manager of manufacturing operations for the firm's Wisconsin mills, were extended to operation at the Potsdam mill.

Allied Chemical Corp.

The following five men have been appointed as sales managers. Walter D. Aust (Philadelphia); Milton O. Ericson (Chicago); Daniel A. McKendry (Milwaukee); Edgar M. Rogers (Seattle, Pacific Northwest); and William J. Rhoads (Albany).

New assistant sales managers and their offices are: Charles J. McCormick (New York Metropolitan); William P. Doyle (Philadelphia); and Wesley G. Webster (Chicago).

O. W. Svenson Jr. has been appointed as assistant sales manager for basic industrial chemicals of the company's General Chemical Division. With the division for 19 years, Svenson was previously manager of General's Chicago and Detroit sales offices, and assistant manager of the St. Louis office.

Robert F. Boman has been appointed as assistant sales manager for basic industrial chemicals of the company's General Chemical Division. He has been with the division for 20 years, previously serving as manager of the Philadelphia and Denver sales offices.

North Carolina State College

Chester G. Landes, chemical consultant of Charlotte, N.C., has been appointed assistant professor of the pulp and paper technology in the School of Forestry. Landes is the author of a number of technical articles and holds over 25 U.S. patents in the paper and chemical fields. He is also a member of TAPPI and is vice-chairman of its Coating Committee. Landes will also continue to maintain a consulting office in Charlotte, N.C.

Brown Co.

C. A. Cordwell has been promoted to the position of sulfite production manager at Brown Co. He has been closely associated with sulfite pulp production since joining Brown Co. in 1926 and has served in various supervisory positions in the Alpha Plant, sulfite bleachery and sulfite mill during the past 34 years. He was made superintendent of the mill in 1950.

John J. McDonald has been pro-

ON THE TOUGH JOBS!

Nicolet Industries' specialty mill in Hamilton, Ohio, produces a wide variety of asbestos materials. It also produces a lot of headaches for most feltmakers.

Yet, over the years, Orr's custom engineered felts have established a high standard of satisfactory service here. In fact, an Orr top felt set a plant production record that has never been equalled. And —the experimental tonnage run during its service wasn't credited toward the production record! At the time of removal, the plant reported the felt still fit the machine excellently.

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moted to the position of general manager of Brown Co.'s Sulfite Pulp and Floc Division. He will be responsible for the manufacture of dissolving and paper grade hardwood sulfite pulps as well as distribution and sales of these products.

F. X. Guimond, manager of pulp manufacturing since February 1956, has resigned in order to accept an executive position with the Parsons & Whittemore-Lyddon organization.

Goulds Pumps Inc.

W. H. Plowman, manager of southwest sales, will now be permanently located in Houston. He has been serving in Tulsa for the past several years.

Robert L. Tarnow, manager of the Chicago branch office, recently completed the prescribed course of study at the Graduate School of Sales Management and Marketing, Syracuse University. He has been with the company for the past nine years in a sales capacity.

Marvellum Co.

P. C. Whiting Jr., has taken over as Mid-Western sales manager for the company. He joined the company immediately following his military service in 1946 and has held various technical and sales positions since that time. He has most recently been manager of product development.

Consolidated Water Power & Paper Co.

Edward P. Kryshak, general construction superintendent, has been appointed chief structural engineer. He has been serving his previous position since 1956.

John E. Drexler has been named general construction superintendent, succeeding Kryshak. Drexler has been employed by the company in construction work for 22 years. He joined the engineering staff in 1945 as a construction foreman.

Joseph M. Fuller has joined the company as product manager of Tubes and Cores. He was previously employed by Sonoco Products Co. Donald L. Mortensen has been promoted to the new position of sales administrative assistant at the Ahdawagam Division.

Conoflow Corp.

John A. Fairbank has been appointed as Philadelphia district manager for the company. He joined the company in 1957 as a sales engineer working out of the Philadelphia office. Before coming to Conoflow, he had eight years of industrial instrumentation experience, his last position as product manager for Robertshaw-Fulton Controls Co.

Rust Engineering Co.

Four engineers at the Birmingham, Ala., office have been appointed to new positions.

William F. Edmonds is the new chief engineer. He previously served as manager of sales.

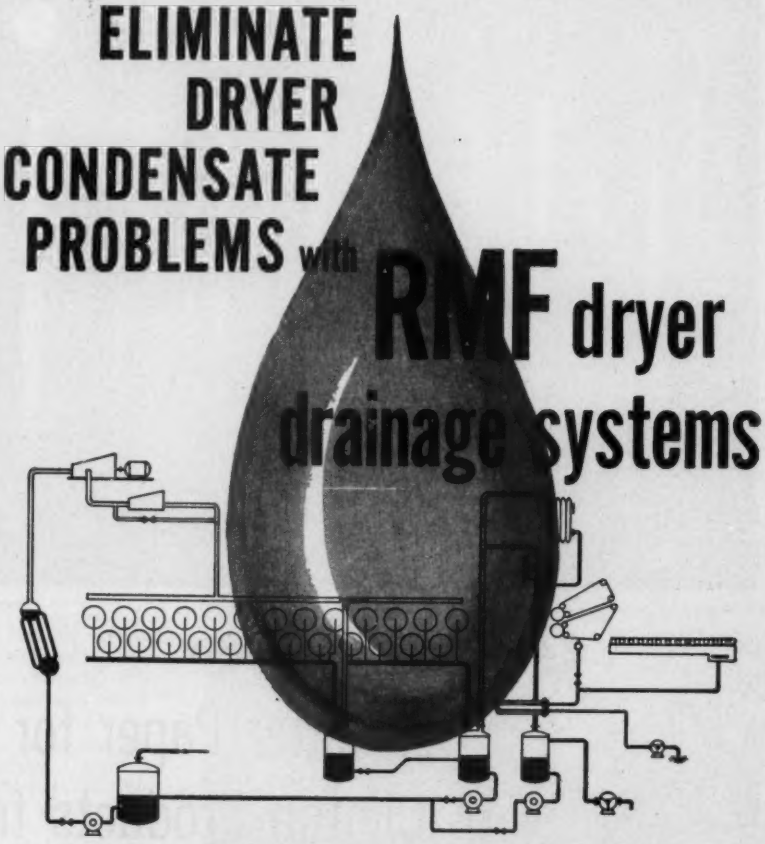
Babcock & Wilcox Co.

Edward L. Ogden has been appointed as director of employee relations for the company. He will now be responsible for the direction and coordination of all personnel, labor relations, personnel development, student training, etc. He joined the company as manager of labor relations in 1959, with 16 years experience in various industrial relations capacities.

Koppers Co. Inc.

Donald L. DeVries has been appointed sales manager of the company's Metal Products Division. Prior to this new appointment, DeVries served Koppers as manager of the Division's industrial gas cleaning department.

ELIMINATE DRYER CONDENSATE PROBLEMS with RMF dryer drainage systems



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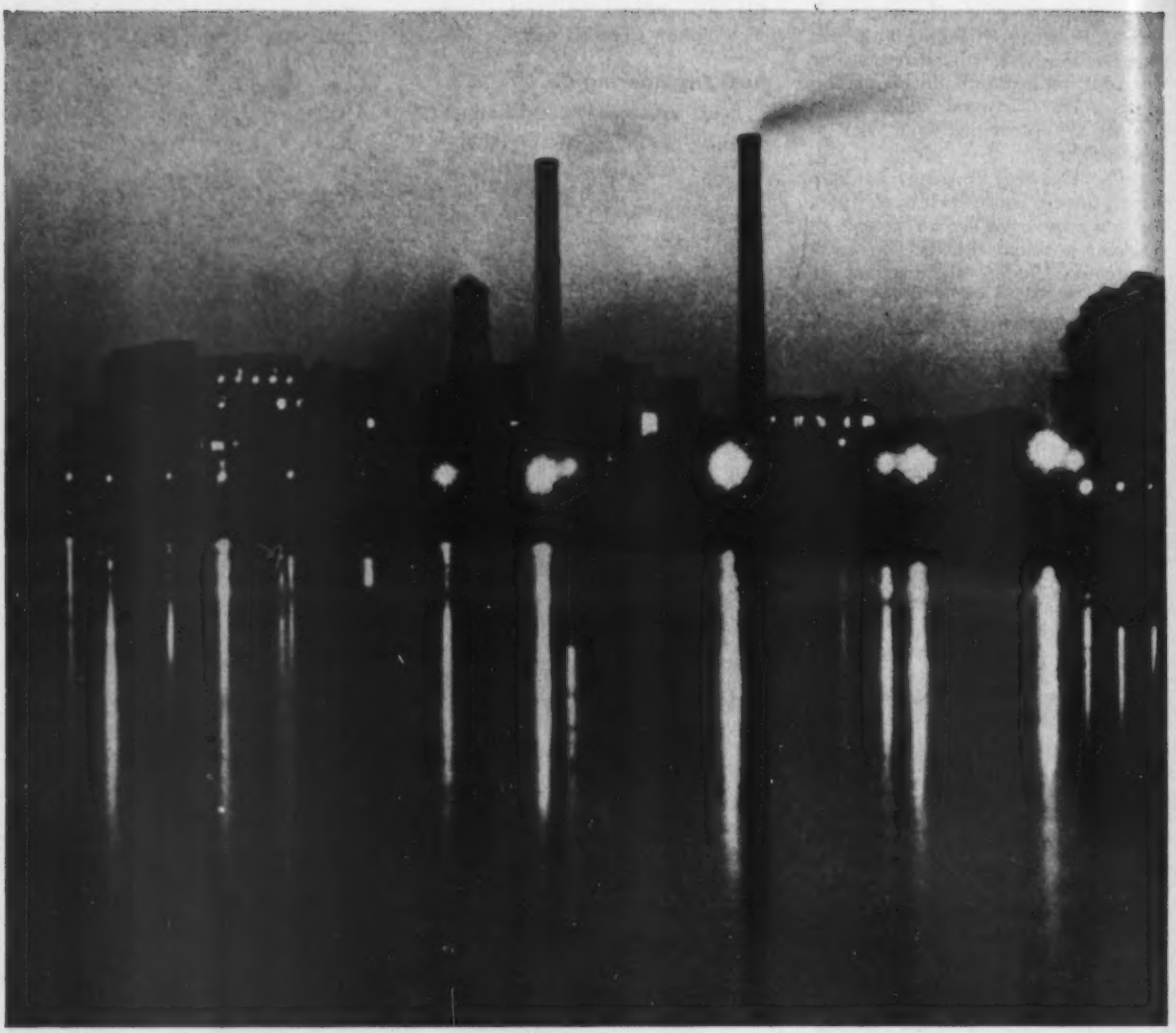

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FOREIGN ABSTRACTS

Corrosive components in paper and board

The general methods for determining such materials are outlined, but no details are given. The specifications for non-corrosive paper products are the following. The pH should not be under 6 or over 8. Elementary chlorine must be absent. Not over 0.05 per cent sodium chloride or 0.3 per cent sodium sulfate are permissible. Elementary sulfur, sulfides or sulfites and ammonium salts should never occur in more than traces. The ash content should not exceed 8 per cent.

Otto Huber., *Oesterreichische Papier Zeitung* 66, No. 6, 11 (1960) (in German).

Pre-impregnation and vapor phase digestion in NSSC pulping.

In any modified NSSC digestion characterized by pre impregnation, the recovery system of excess liquor is of interest. This also applies to vapor phase cooks. The concentration of the liquor (which in the present experiments was very high), depended on the absorptive capacity of the wood used. Effects of these high concentrations on the yield and pulp quality were studied, and the recovery of excess liquor and vapor phase cooking techniques are described. In the case of pine and beech wood, the higher concentrations used in the cooks yielded pulps that were lower in lignin than the commercial NSSC pulps. Based on lignin-free pulps, the over all yields were higher than pulps prepared by the usual method, and the new pulps also showed higher breaking lengths, burst, folding endurance, and brightness. The Brecht-Imset tear test gave somewhat lower results. The authors believe that the lower lignin values might effect saving in bleaching chemicals. One of the more interesting features of the newer technique is that the method can be used with pine wood which usually resists impregnation.

17 references are included. Georg Jayme, Ursula Schwartzkopff, and Peder Kleppe. *Das Papier* 14, 186 to 90 (1960) (in German).

Moisture in trees and in piled pulpwood

The author studied the monthly variations in moisture content of standing spruce and balsam trees and of logs piled in the brush. Throughout the summer there was little change in the moisture distributions of standing trees. For balsam there was a maximum variation of 4.5 per cent; for spruce it was 6.5 per cent. The difference between the moisture content at the top and at the bottom of a standing balsam was 13 per cent; for spruce it was only 5 per cent. Measured on a gravimetric basis, the mean values for moisture in the living trees were 56.5 per cent for balsam and 42.8 per cent for spruce.

On a purely volumetric basis, the respective values were 30 and 24 per cent. In the case of piled logs, no differences were found in the rate of drying when averages by month of cut were compared. However those logs which had the smallest diameter showed the most rapid drying rate. Over a years period, balsam logs dropped from an initial moisture content of 55.25 per cent to one of 41.73 per cent. Spruce logs dropped in moisture content from 41.5 to 28.5 per cent. However the corresponding weight losses were 25 per cent for balsam and 19 per cent for spruce.

A. D. Truman. *Pulp & Paper Mag. Can.* 60, No. 11, 151 to 152, 154 to 155, and 158 to 159 (Nov. 1959) through *Abstr. Bull. Inst. Paper Chem.* 30, 1211 (1960).

Alkaline oxidation of pulp

A rayon grade bleached pulp (made from beechwood) was treated with 17.5 per cent sodium hydroxide warmed to 45° C, and then treated for 20 hours with a stream of oxygen. This led to marked yellowing and degradation. The alkaline solid phase was then regenerated by means of acid, and the resistant cellulose was subjected to hydrolysis. The hydrolyzate when chromatographed showed less mannose and xylose units than did the original pulp, but contained more carboxyl groups.

The alkaline liquid phase from the above treatment (with oxygen), when neutralized gave a powder which, besides sodium sulfate, contained a polysaccharide yielding mostly xylose, with some mannose and glucose units. The alkaline-oxygen treatment caused a loss of about 9 per cent of the original weight of the pulp. The ether extract of the acidified alkaline solution gave a series of acids, which included formic, glycollic and lactic acids. There was no evidence of tartaric, levulinic or glyceric acids at this point.

Following the ether extraction, butanol was used as solvent.

Expansion of Finnish pulp mills in 1959

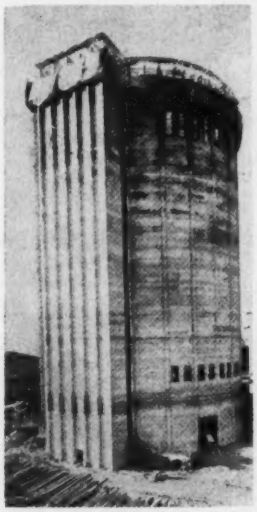

Fig. 1 (above)

Fig. 2 (below)

This gives a resumé of recent additions to departments, mills and laboratories in Finland, with 23 illustrations. In the mechanical pulp industry, Ahlström Oy and Stockfors, Ab. additions are described. In the chemical pulp industry, the additions to the following are outlined: Enso-Gutzeit Oy (Kaukopää and Kotka Mills), Ab. J. W. Enquist Oy., Joutseno-Pulp. Oy, Kajaani Oy (the washers of whose Bleach plant are shown in Fig. 1); Oy Kaukas Ab. (whose new "L-drier for chemical pulp is shown in Fig. 2); Kymmene Ab.; Metsäliiton Selluloosa Oy; Nokia Ab.; Oulu Oy; Rauma-Repola Oy; W. Rosenlew & Co., Ab.; Oy Toppila; Veitsiluoto Oy; and Yhtyneet Paperitehtaat Oy.

Anon, *Finnish Paper and Timber* 10, No. 5, 54 through 58, 61 through 64, and 72 (1960) (in English).

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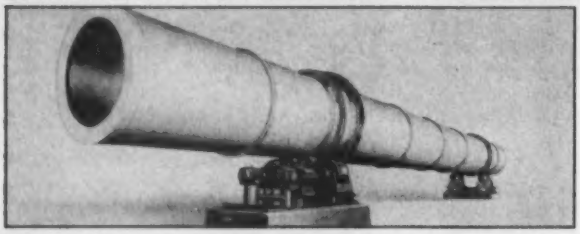

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Can. Pat. No. 477,588

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Foreign Abstracts . . .

This extract was dialyzed, giving a brown fraction of high polymeric material and a yellow dialyzate, which contained acidic materials. The exhaustively extracted solid residue (a modified gamma cellulose?) was separated by ion-exchange sorption into a neutral polysaccharide system containing glucose, mannose and xylose units, and into an acid fraction which yielded these same sugars. This acid fraction was examined further by esterification, methylation, *et al*, and gave a complex mixture of low molecular weight acids which included methoxyacetic and methoxypropionic acids. No sacharinic acid, gluconic, or glucuronic, acid derivatives were found. The significance of these oxidation studies and possible further work is discussed.

Fifty-eight references. K. Kratzl and E. Wittman, *Holzforsch. u. Holzwert*, **11**, No. 2, 21 through 23 (1959); through *Abstr. Bull. Inst., Paper Chem.* **30**, 1576 through 77 (1960).

Pulp "crill"

This paper, evidently the first of a series, calls attention to particles in the "fines" fractions, especially in the case of beaten pulps. The term "crill", which is used to describe these particles, stems from the Norwegian designation for pelagic organisms. Crill contributes greatly to many of the important properties of pulp suspensions and consists mainly of slender fibillae, in that portion of the pulp which is not necessarily entangled in the fibrous plug during the pulp flow. These loose fibrils have frequently been overlooked, and this was apparently due to the techniques used in preparing pulp samples for microscopic observation and also to the type of microscope used. Although weight-wise, crill is often very small, it seems to be a dominant factor in drainage problems.

By the usual methods for preparing pulp samples for microscopic examination, crill is often washed away. The best optical method for certain studies of this fraction is to place the *unwashed* pulp suspension on the slide, to dry the sample by omitting a cover glass, and then to use a phase contrast microscope. This method

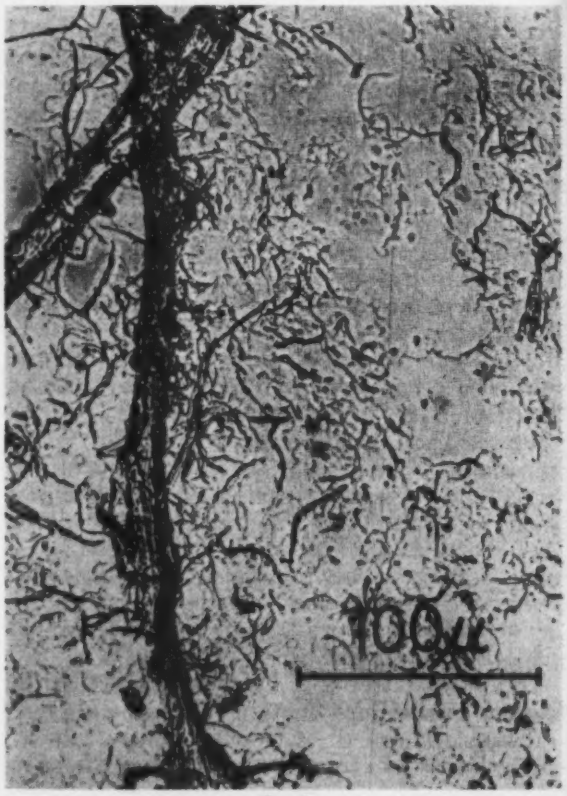


Fig. 3

is inadvisable when morphological studies are to be made, and the authors describe techniques applicable for this purpose. The crill, which consists of discrete particles, is what some other investigators have probably described as "slime" caused by beating. Fig. 3 shows a photomicrograph taken under a phase contrast microscope; it shows portions of 2 intersecting kraft pulp fibers, as well as the crill described above.

Nine references. Börge Steenberg, Bertil Sandgren, and Douglas Wahren. *Svensk Pappertidn.* 63, 395 to 397 (1960). (in English).

Boundary layers of streaming fiber suspensions

A theory and method for measuring concentration gradients in streaming particle suspensions were developed. Experimental work was limited to pulp suspensions. The experimental data indicated the existence of a concentration gradient near a wall passed which the suspension flowed. The concentration of the suspended particles near that wall was not zero, as hitherto assumed, and these particles were found to be different from those in the bulk of the suspension.

They are due to fines present in unscreened pulp suspensions. This was shown both by microscopic examination of the material

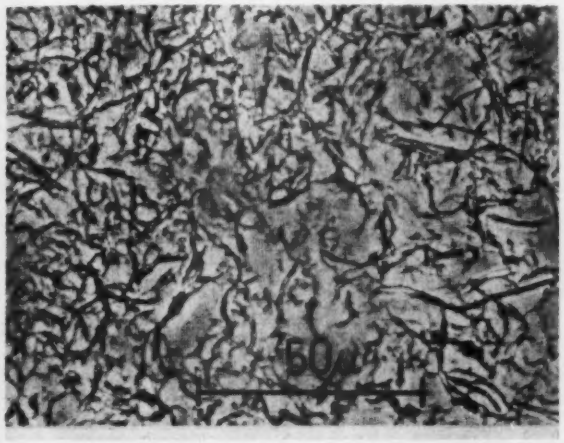


Fig. 4

(cf. Fig. 1) and by means of an empirically established relationship between filtration variables, because standard filtration equations could not be applied to a suspension of this material. The nature of these fines will be discussed in subsequent papers.

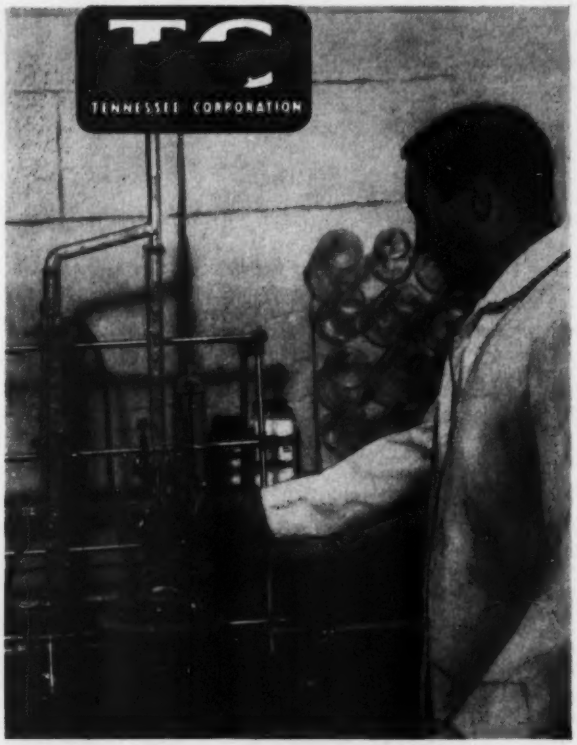
Börje Steenberg and Douglas Wahren. *Svensk Papperstidn.* 63, No. 11, 347 to 355 (1960) (in English).

Determining dry adhesive strength of gummed paper

A method was devised for the determination of this strength, in the case of the gummed papers used in package sealing tapes. In this test the temperature of the water used in moistening, the duration of "swelling", and the pressure used in affixing the sample were held constant. The average deviation in the case of ten measurements was 2 to 5 per cent and the coefficient of variance (which ranged from 6 to 16 per cent) was believed to be adequate for technical purposes. Using this method the adhesive strength of 14 fiber-reinforced gummed tapes was tested.

The tear resistance of these tapes varied from 7.2 to 18.3 kg/cm., and showed no correlation with the respective bursting strength. Tensile shear strength of adhesive joints one square centimeter in area on a backing of machine leatherboard was 5 to 7 kg/sq. cm. The strongest samples were then tested for maximum shear load, using a large overlap on solid board backing. At an optimum overlap of 3 cm., the maximum load-carrying capacity of the adhesive joint was 16.5 kg.; the strip itself could have withstood as much as 18.3 kg. These findings indicate that the further development in the improvement of the strength of tapes would be useless (by simply improving fiber reinforcement, etc) without at the same time improving the adhesive strength of the glues used.

W. Bartusch, *Verpackungs-Rundschau* 11, No. 2; *Supplement* 9 through 15 (Feb. 1960) (in German); through *Abstr. Bull. Inst. Paper Chem.* 30, No. 11, 1461 (1960).



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PATENT REVIEWS

DR. MELVIN NORD

Coating of paper

U. S. 2,937,955, issued May 24, 1960, to Joseph T. Loomer and assigned to Continental Can Co. Inc., provides a process by which a paperboard base of relatively low color may be coated, on the paper machine if so desired, with a mineral coating composition in sufficient thickness to raise the color to almost any desired value and with a smooth surface capable of taking the finest printing and capable of being varnished to produce an exceptionally high gloss. To this end the present invention provides a process and apparatus by which a ground coat of high solids content mineral coating composition is applied by roll coating with deliberate, or at least inevitable, formation of a well defined pattern. The ground coat is then dried to a point such that it is dry to the touch and, preferably, while it is still warm from such drying step, an over coating of relatively low solids content mineral coating compound is applied by doctor coating.

The doctor device is so adjusted as to level the over coating approximately upon the high spots of the ground coat whereby substantially to fill all of the low areas in the pattern of the ground coat. In this manner a heavy relatively rough ground coat may be applied and relied upon to cover and thus to upgrade the color of the base sheet. The over coating may be relied upon to supply an unusually smooth and level surface to meet the demands of printing and finishing. This entire process may be carried out on the paper machine as a continuous process integrated with the manufacture of the base sheet and it may be carried out at a wide range of operating speeds including those practical of the manufacture of such relatively low-priced products as the paperboard customarily used in the manufacture of folding boxes.

As shown in Fig. 1, a relatively dry web 10 is conducted over a stack of calender rolls 14, commonly known as a breaker stack. From the breaker stack the web 10 is conducted around a guide roll 16 and up through a roll coating device 17 provided with a coating roll 18 and a backing roll 20.

From the roll coating device 17 the web is conducted through suitable drying stages where the ground coat may be dried at least to a condition known in the art as "dry to the touch". For example, one or more dryer elements diagrammatically illustrated at 28 may be positioned immediately above the coating roll 18. The web 10 may then be conducted over a guide roll 30 to assume a generally horizontal path and further drying elements 32 may be disposed adjacent to the horizontal path if desirable.

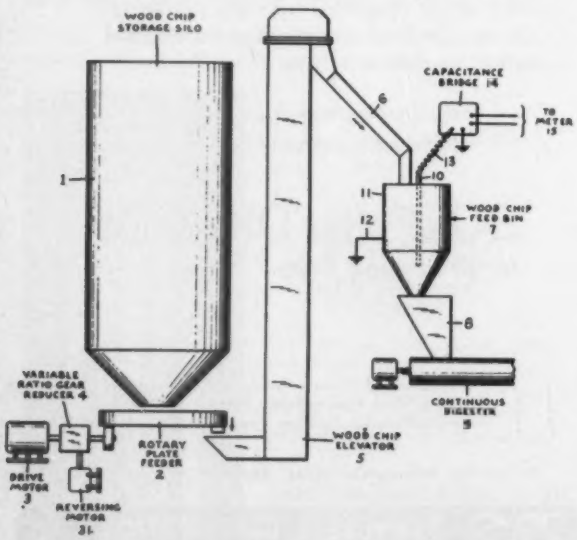

Fig. 1

The web 10 is then conducted over a backing roll 34 in such a manner that the surface having the ground coat on it is disposed outwardly. A doctor coating device 36 is associated with the backing roll 34 for the purpose of applying a second layer of coating material referred to herein as an over coat. The doctor device serves to force or trowel the over coat material into the low spots or areas of the ground coat and to level the surface of such over coat approximately even with the highest spots or areas of such ground coat.

After the application of the over coat in the doctor coating device 36, the web 10 may be conducted past one or more dryers such as 40. The capacity of the dryer or dryers 40 is such that the two layers of coating material will be rendered sufficiently dry to be safely conducted over the surface of a guide roll 42. From the guide roll 42, the web 10 may be conducted over one or more finishing calender stacks 44 and 46. From the last finishing calender stack the web 10 may be delivered to a reel or sheeter, as desired.

Preventing deposition of pitch from sulphite pulp

U. S. 2,932,602, issued April 12, 1960 to Sigbjorn P. H. E. Holgersson and Kjell J. I. Groth, assigned to Kopparfors Aktiebolag, describes a method of preventing the deposition of pitch from unbleached sulphite pulp and suspensions of such pulp.

A cationic surface-active agent is added to the pulp, in an amount of at most 0.1 per cent calculated on the dry pulp. The surface-active agent may be an alkyl amine, an alkyl-ammonium base, an alkyl-pyridine base, or the salt of one of these.

The result is to cause a fixation of the particles of the pitch on the fibers of the pulp.

Bleaching of pulp

U. S. 2,938,826, issued May 31, 1960 to Paolo Marpillero and assigned to Société pour l'Amelioration et le Development des Procédes Industriels (SADEPI), describes a process for bleaching chemical or semi chemical cellulose pulps.

An aqueous suspension of the pulp is contacted at 20 to 80° C. with a metallic chlorate (e.g. sodium chlorate) in the presence of a vanadium catalyst. The chlorate is present in an amount within the range of 0.2 to 10 per cent by weight of the pulp, and the suspension contains 1 to 2 grams of acid per liter of suspension.

Sizing of paper

U. S. 2,941,919, issued June 21, 1960, to Spencer H. Watkins and assigned to Hercules Powder Co., describes a process of sizing paper.

To an aqueous dispersion of paper pulp is added an aqueous and partially neutralized dispersion of tall oil rosin (¼ to 4 per cent of the rosin, based on the weight of dry pulp), the tall oil rosin having been subjected to treatment with 1 to 4 per cent of formaldehyde at 100 to 200° C. in the presence of an acid catalyst prior to saponification with aqueous alkali.

High ash content absorbent paper

U. S. 2,943,013, issued June 28, 1960, to Hanns F. Arledter and assigned to Hurlbut Paper Co., discloses a method of producing a high ash content, light-fast absorbent paper for the decorative laminating industry.

The paper consists of 30 to 70 per cent cellulosic fibers, 30 to 70 per cent of filler particles, 0.1 to 1 per cent of guar gum (or

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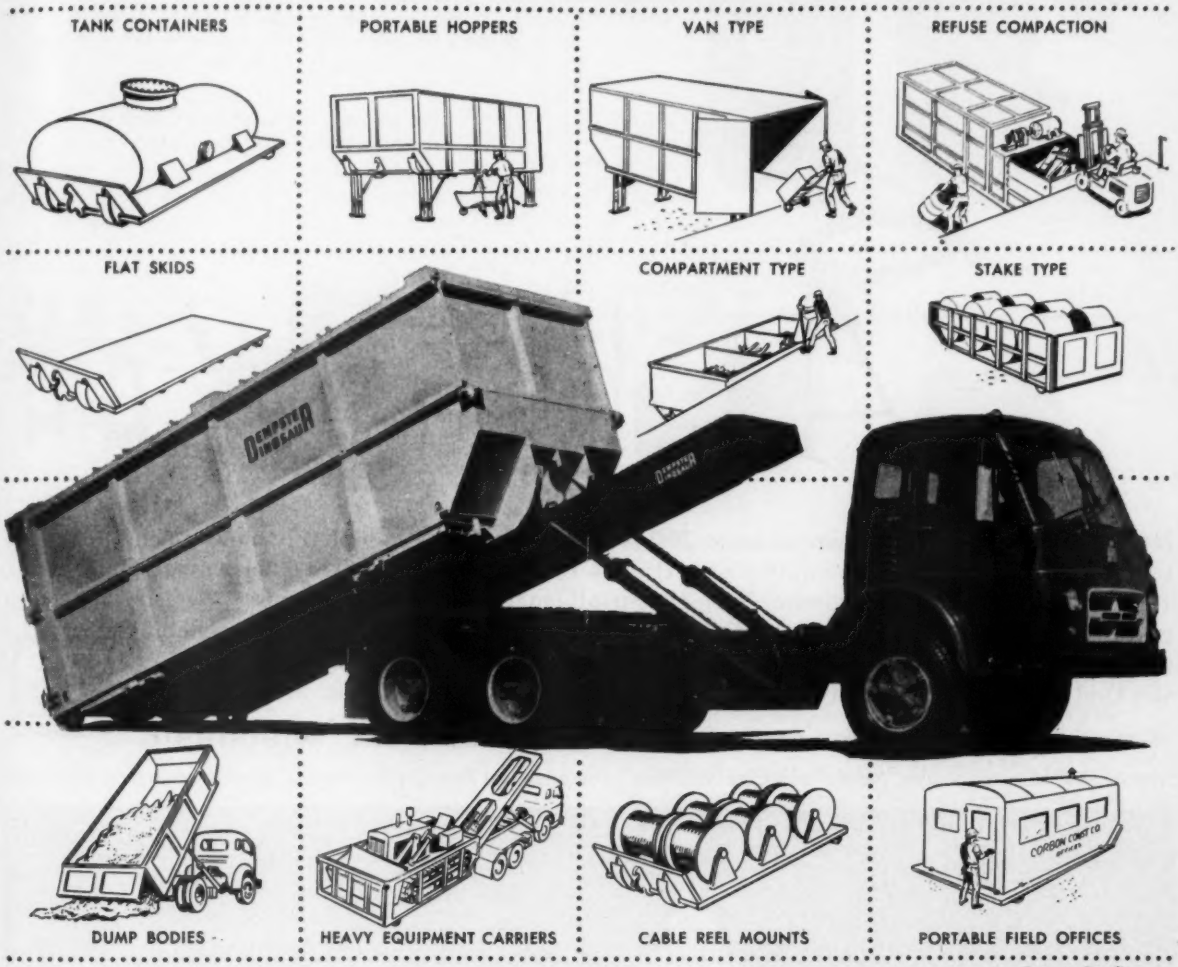

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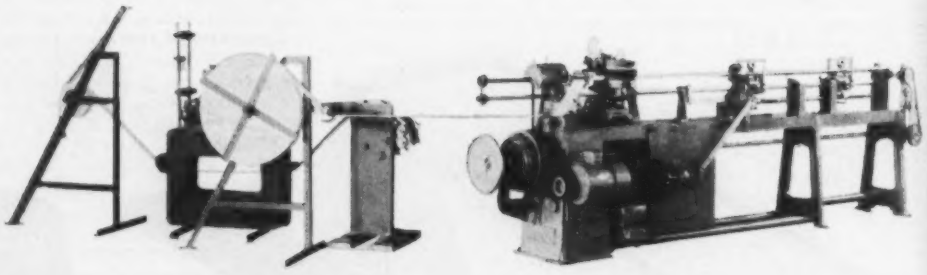

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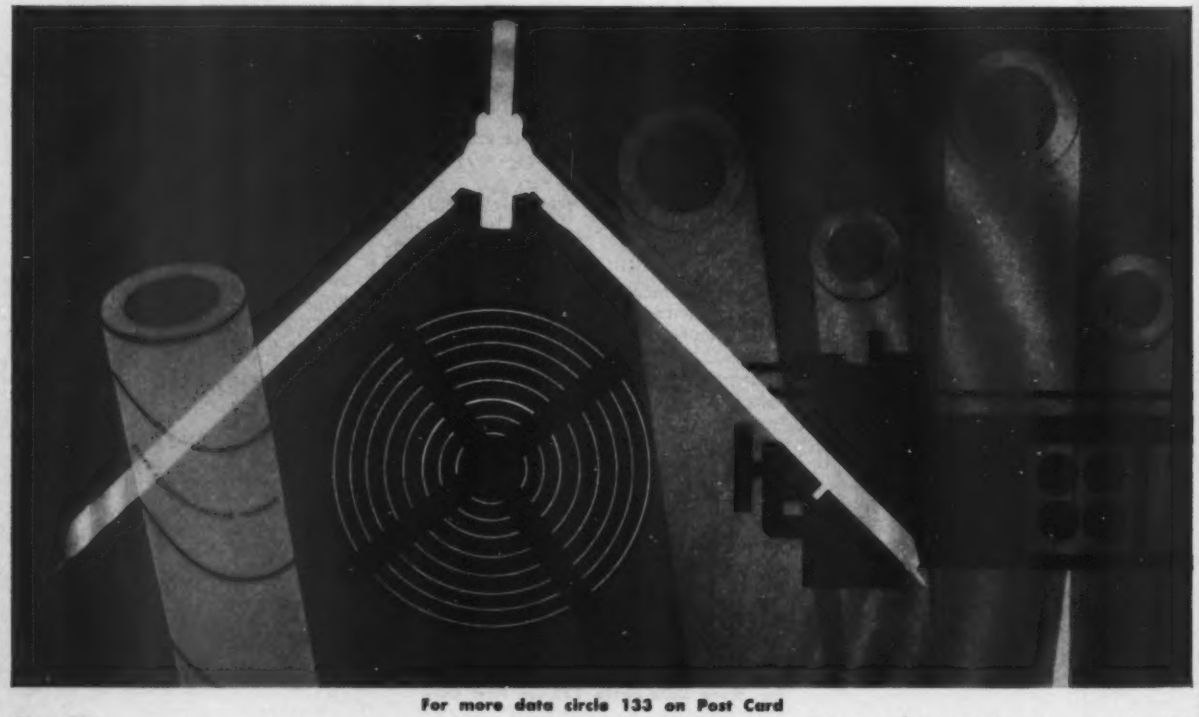

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similar substances), and 0.3 to 1.5 per cent of a resin such as polyethyleneimine.

The filler particles contain 20 to 40 per cent of siliceous particles 2 to 8 microns in diameter (refractory index below 2.3), 10 to 25 per cent of opacifying filler particles less than 1 micron in diameter (refractory index above 2.3) and have a coating of aluminum hydroxide to impart lightfastness.

Other Patents of Interest to the Pulp and Paper Industry

Subject	Inventor or Assignee	Patent No.	Date
Self-positioning siphon carrier for drier drums	Howard Smith Paper Mills, Ltd.	2,934,831	5/3/60
Collapsible pyramid structures	Karl E. Koehler	2,935,238	"
Self-locking pliable sheet construction	Roy W. Marsh	2,935,239	"
Bag	Bemis Bro. Bag Co.	2,935,241	"
Paper containing a starch ether	National Starch & Chemical Corp.	2,935,436	"
Preparation of a pigment-filled paper	Columbia-Southern Chemical Corp.	2,935,437	"
Recovery of useful products from spent sulfite liquor	Puget Sound Pulp & Timber Co.	2,935,504	"
Machines for stripping unwanted material from cut blanks of cardboard	William E. Walker	2,935,916	5/10/60
Manufacture of containers	Rapinwax Paper Co.	2,935,919	"
Fiberizing press for wood chips	The Bauer Bros. Co.	2,935,931	"
Presses for processing paper and cardboard	J. Bobst & Son S. A.	2,935,932	"
Mobile whole-tree woodchipper	The Bauer Bros. Co.	2,936,008	"
Can holder	Elmer E. Munkachy	2,936,068	"
Can carriers	Waldorf Paper Products Co.	2,936,069	"
Collapsible cartons	Bloomer Bros. Co.	2,936,103-4	"
Apparatus for the treatment of paper stock	Howard Bidwell	2,936,128	"
Chemical recovery unit for residual liquor	Combustion Engineering, Inc.	2,936,215	"
Convertible container	Crown Zellerbach Corp.	2,936,239	"
Papermaker's dryer felt	Scapa Dryers, Ltd.	2,936,796	5/17/60
Molded pulp packing tray	Keyes Fibre Co.	2,936,922	"
Holder for milk cartons	William H. Peters	2,936,927	"
Dispensing carton	Reynolds Guyer	2,936,937	"
Box structures	Oliver Lundquist	2,936,939	"
Display cartons	Warren Nevins	2,936,942	"
Cartons	David Leokoff et al	2,936,943	"
Telescopic self-sealing containers	George A. Moore	2,936,944	"
Dispensing device	Joseph Michiel	2,937,742	5/24/60
Display carton	KVP Sutherland Paper Co.	2,937,743	"
Coating of paper	Continental Can Co., Inc.	2,937,955	"
Continuous pulp digester	Joaquin de la Roza, Sr.	2,938,580	5/31/60
Fourdrinier wire stringing method	Beloit Iron Works	2,938,581	"
Apparatus for making molded pulp articles	Diamond National Corp.	2,938,582	"
Container	International Business Machines Corp.	2,938,623	"
Paper bags having airtight areas to facilitate automatic bag feeding	Jack D. Helm	2,938,657	"
Continuous digestion apparatus	Aktiebolaget Kamyr	2,938,824	"
Paper sampler	John J. Cannan	2,939,210	6/7/60
Egg carton	Jesse R. Grant	2,939,602	"
Container	Buchanan Electrical Products Corp.	2,939,621	"
Partitioned folding containers	Joseph M. D'Ippolito	2,939,622	"
Carton divider	John Riccardi	2,939,623	"
Dome-pack container	St. Joe Paper Co.	2,939,624	"
Container with locking closure	Container Corp. of America	2,939,625	"
Pulping process	Columbia Cellulose Co. Ltd.	2,939,813	"
Dry felting process	Weyerhaeuser Co. and Wood Conversion Co.	2,940,133-5	6/14/60
Air doctor device	The Black-Clawson Co.	2,940,418	"
Paperboard chairs	Fleming & Sons Inc.	2,940,513	"
Loading and unloading apparatus for fiberboard	Aktiebolaget Svenska Flaktfabriken	2,940,614	"
Folder lock	Waldorf Paper Products Co.	2,940,655	"
Core-shaft remover for paper unwinding apparatus	International Paper Co.	2,940,681	"

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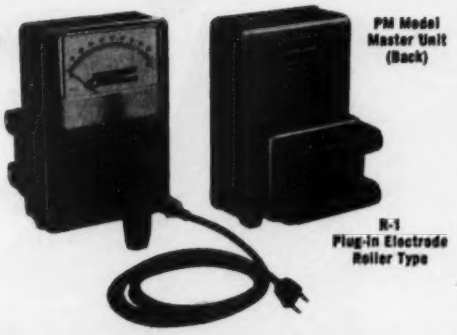

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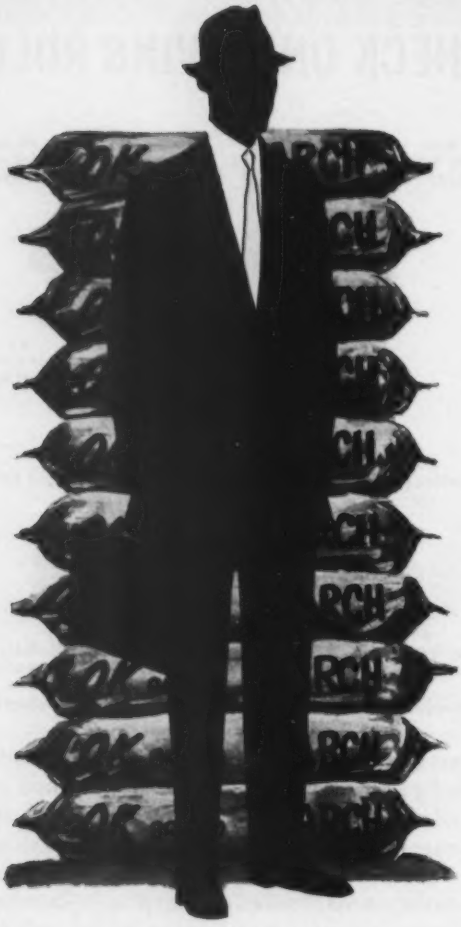

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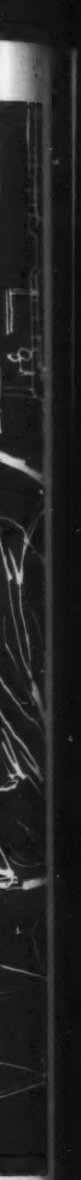

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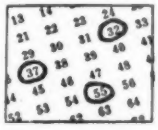

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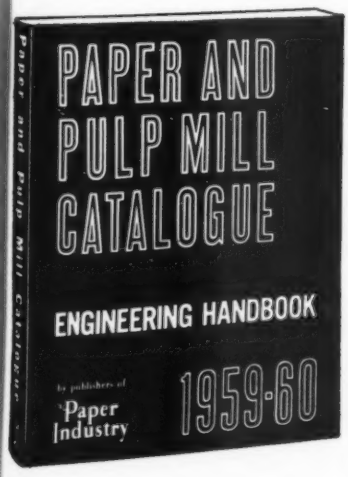

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- New Products
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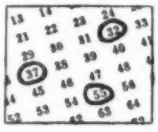
To obtain further information quickly—and at no obligation—on any of the above items in this issue, circle the corresponding number on the attached card. We will forward your request promptly to the manufacturer, who will send the information directly to you.



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- **Buyers Service Section** — includes a comprehensive, cross-reference list of machinery, equipment, materials and chemicals with names of responsible manufacturers and suppliers; a list of trade names; complete addresses of all firms that are listed in the Section; and a directory of educational institutions in the United States and Canada having courses of instruction in the manufacture of pulp and paper.
- **Engineering Handbook Section** — a compilation of practical engineering data, formulas, graphs, charts, tables, etc., including a section dealing with uses and hazards of chemicals used in pulp and paper making. New material added yearly.

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NEW PRODUCTS

These items are numbered for your convenience. Further information on the various products described may be requested at no obligation through our Readers' Service Dept. Use the business reply card in this issue.

Antifoam

A new antifoam has been formulated specifically to function under acid pH conditions encountered in paper machine operation. The material is a liquid blend of esters, emulsifiers and surface active agents. It has a freeze-thaw recovery of 30° F. and is said to emulsify instantaneously, without stirring, in water as hard as 400 ppm. This antifoam can be fed continuously either in dilute or concentrated form by a chemical pump. Dosages vary between one-tenth and three-quarters of a pound per ton of fiber. *Nalco Chemical Co.*

Circle No. 1 on Readers' Service Card

Double disc refiner

A large capacity, double disc refiner has been designed to offer unrestricted stock flow to the refining areas, thus uniform operating motor loads. Feed to the discs is by means of a full 12-in. diameter throat screw directly into the refining zone.

Standard direct coupled motors are used with this refiner which is said to be capable of continuous 24 hr. service per day with 1600 applied horsepower. *Sprout, Waldron & Co. Inc.*

Circle No. 2 on Readers' Service Card

Spacer coupling

These couplings are equipped with special detachable hubs that permit the coupling of shafts spread as far apart as 7½ in. and may be removed without disturbing shaft alignment.

The spacer-type coupling consists basically of two flanges and a two-piece flexible rubber sleeve. The teeth of the sleeve halves lock into the teeth of the flanges without clamps or screws, tightening under torque. Shaft ends fit into the hubs which are attached to the coupling flange by four cap screws. To remove coupling from the shafts, the four cap screws are loosened, allowing the central flange-and-rubber-sleeve section to be lifted out.

Pneumatic vibrator

A new pneumatic impacting vibrator with special mounting brackets for 4-, 6-, or 8-in. standard pipe has recently been announced.

According to the manufacturer, the NAVCO BH-2 air vibrator keeps wet, moist material moving through all types of piping arrangements. Powdered coal, carbon black, ores and fly ash are dislodged by timed piston impact. These vibrators are said to function in hazardous atmosphere, under extreme moisture conditions, on outside applications or where magnetic dusts exist. *National Air Vibrator Co.*

Circle No. 3 on Readers' Service Card

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Standard couplings range from a minimum stock bore of ⅜ in. to a maximum bore of 3¼ in. *T. B. Wood's Sons Co.*

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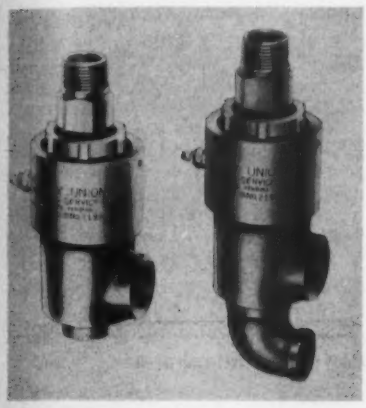
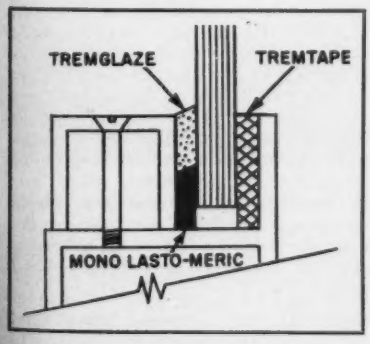


Rotary union

This revolving connection forms a positive seal between a stationary supply line and revolving equipment. It is produced in two types; type "P" is a single inlet unit designed to convey liquids or gases into or out of revolving machines, rolls or drums, while type "S" has dual pipe connections where both supply and return of gases or liquids are required within the same unit.

This rotary union handles steam, water, air, vacuum, gases and industrial fluids on applications up to 250 psi and 150 psi steam, temperatures up to 500° F. without adjustments. *Perfecting Service Co.*

Circle No. 5 on Readers' Service Card



Liquid polymer sealant

A new factory mixed liquid polymer sealant, now available, is recommended for channel glazing, bedding and sealing joints of most panels and lights, caulking and pointing. It adheres to porous and nonporous surfaces (metal, masonry, glass, wood, etc.) without staining. Normally no priming of surface is necessary; it retains slight surface tack, can be painted, reaches its ultimate degree of set and firmness in one or two months without noticeable hardening thereafter, can be tooled after gunning, and is available in a wide range of colors. *Tremco Mfg. Co.*

Circle No. 6 on Readers' Service Card

Brine headers

Duracor chlorine saturated brine headers in reinforced plastic offer a combination of chemical, heat, flame and abrasion resistance. These brine headers are especially adapted to paper, textile and chemical processing industries where the chlorine content of solutions is extremely heavy.

The units are available in standard 8- and 16-ft. lengths and 6-, 8-, 10- and 12-in. diameters. Tensile strength ranges from 11,000 to 15,000 psi and flexural strength from 20,000 to 30,000 psi. *Ceilcote Co.*

Circle No. 7 on Readers' Service Card

Anti-backlash nut

This assembly consists of a body and insert loaded against a mating screw by springs. Six sets of springs are available for each body size permitting a wide selection of preload so as to keep required torque at a minimum for impressed thrust load. *United Control Systems Inc.*

Circle No. 8 on Readers' Service Card

Organo-sulfur slimicides

Liquid form Nalcon 242, and ball briquette form Nalcon 245, are two new organo-sulfur slimicides, said to have superior killing and dispersion action on mill mocro-organisms. Both have strong anionic dispersant properties and neither contain phenolic materials or heavy metals. These new products have built-in bactericidal and fungicidal characteristics specifically for control of slime formers in pulp and paper mill systems.

Nalcon 245 is available in fiber drums that hold approximately 270 lb. Nalcon 242 is shipped in non-returnable 55-gal. lined steel drums that hold approximately 510 lb. of the chemical. *Nalco Chemical Co.*

Circle No. 9 on Readers' Service Card

Plastic clamps

Polypropylene clamps are said to have high tensile strength and great rigidity; excellent dialectric properties, and resistance to solvents, grease, oil, common acids and chemicals. They open to any diameter and are held in place by a single rivet, screw or bolt. *Holub Industries Inc.*

Circle No. 10 on Readers' Service Card

Dry-flow meter

This meter operates on an impact principle, translating unit weight of steam flow into electrical current with a new type of

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Without Modification

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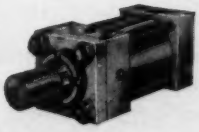

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Hydraulic Cylinders

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For more data circle 138 on Post Card

New Products . . .

electronic transducer. Addition of a controller and volumetric feeder permits automated control of a dry-flowing material process. *Industrial Processes Inc.*

Circle No. 11 on Readers' Service Card

Feed rollers

New air pressure controlled feed rolls are said to reduce jam-ups at bag machine feed stations caused by uneven pressure on paper rolls. The device automatically compensates for any slight variation in paper caliper and operates on an in-plant air line or a compressor hookup at the machine. *Potdevin Machine Co.*

Circle No. 12 on Readers' Service Card

High lift mast

A displacement-type cylinder was used recently in designing an extra high lift mast to handle rolls of paper with a standard, heavy duty Model 2-H paper roll clamp.

Maximum mast height possible, available on Yale K-51 electric trucks, is 38 ft. to the centerline of paper roll rotation. Lift speeds are 40 fpm with a full 5,000 lb. load and 65 fpm empty.

Roll clamping pressure is maintained and accidental dropping prevented by use of a clamp safety circuit. Thus the operator can not release a load until it is resting on a firm base. *Yale & Towne Mfg. Co.*

Circle No. 13 on Readers' Service Card

Centri-Cleaner

A 180 GPM centri-cleaner with a head diameter of 9-in. has recently been designed for use on machines making high grade papers such as ledger, bond, offset, etc.

The No. 609 is also recommended in the secondary and tertiary stages of No. 620 installations where volume is correct. Pressure drop across the cleaner is 50 psi.

The unit has a capacity double that of the No. 606, yet is priced competitively with the latter. *Bauer Bros. Co.*

Circle No. 14 on Readers' Service Card

Portable radiophone

The VP-100, a new portable communications unit, with an average range of one half to three miles, has recently been made available. This 100 milliwatt, crystal-controlled radiophone with receiver squelch operates on any one of the 22 channels of the citizen's band, is fully transistorized and completely self-contained with exception of the lapel microphone.

Power is provided by one 9-volt 2U6 Burgess or 216 Eveready battery and may be replaced through panel in back of unit. Included are two external jacks for long wire antenna and earphones and telescoping antenna which can be fully collapsed into case. *Morrow Radio Mfg. Co.*

Circle No. 15 on Readers' Service Card

Universal slitter

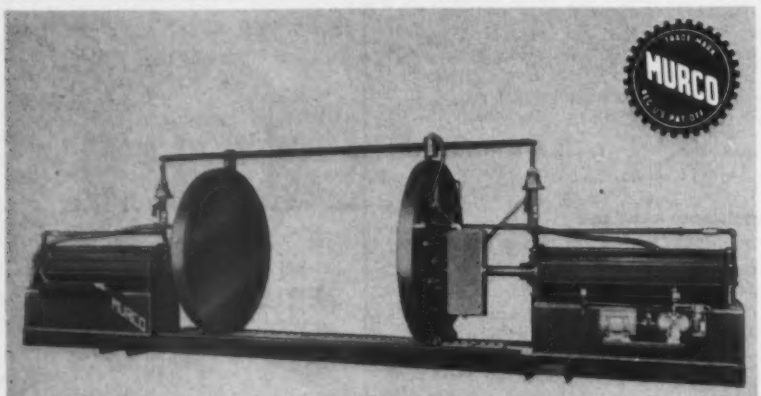
This new slitter is said to control winding tensions by incorporating an oil-shear, hold-back and rewind clutch. Automatic constant tension and controlled, or tapered tension on the rewind, is accomplished by means of a follower on the unwind.

Selection of web tensions is made by the operator on a Vernier master control, feeding filtered voltages into coils of the oil-shear units. Master control settings may be adjusted two or three times during processing, dependent upon build-up. For automatic control, a follower or tachometer generator system is used. *Web Controls Corp.*

Circle No. 16 on Readers' Service Card

Lattice model constructions kits

Crystal lattice model construction kits are now available for "do it yourself" building of lattices. These models are said to provide excellent 3-dimensional visual demonstrations of the crystal structure of matter for chemistry, solid state physics and minerology.



If YOU SHIP PAPER IN ROLLS.....

MURCO Roll Heading Machines

Here is a machine that will operate efficiently and continuously day-in-and-day-out without any attention that is so common with roll heading machines of lighter construction. The pioneer Roll Heading Machine in the industry, MURCO Roll Heading Machines are made in various sizes — 24" to 72" diameter and lengths varying up to 200". Installations in mills throughout the country.

If you ship paper in rolls, just tell us the size of your rolls and your present method of heading rolls . . . we will submit a proposal to meet your requirements . . . without obligation.

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- Valve may be operated from any position
- Rollers of solid aluminum or wood
- Heavy frame construction that requires no maintenance

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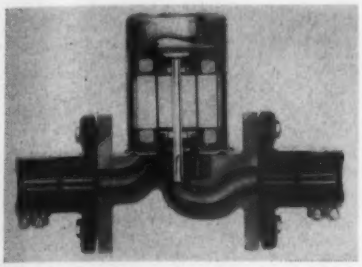
Different lattice models can be built to show the systemic arrangement of crystals and crystallographic properties such as periodicity and symmetry. A small model can be enlarged periodically in the direction of the three coordinates to show the origin and growth of crystals. Spheres can be closely packed to demonstrate how space is filled up and the size of holes. *Arthur S. LaPine & Co.*

Circle No. 17 on Readers' Service Card

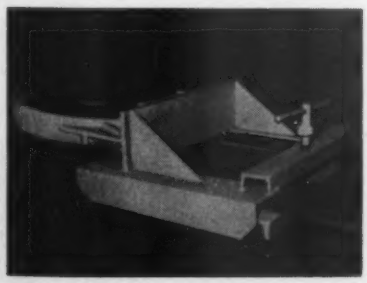


Water circulator pump

A compact, sealless water circulator pump, combining motor and pump in a single unit, is shown in the above picture. This unit measures 6x7 in., weighs 11 lb., and handles up to 90,000 BTU/hr. in systems or zones with a 20° temperature drop.

Designed for use on closed water systems free of foreign objects and materials, it has no stuffing box and requires no seal. Suitable for pressures to 30 psi and temperatures to 220° F., this unit is available for operation on either 115 or 220 volts, single phase, 50 or 60 cycles. *Dyna-Pump Div., Fostoria Corp.*

Circle No. 18 on Readers' Service Card



Drum handler

The drum arm illustrated is said to handle all sizes of steel drums, containing chemicals used in paper products, quickly and safely. These drum handling arms automatically pick up drums in the vertical position, one or two at a time, and can be mounted on the forks or apron of any lift truck. *Little Giant Products Inc.*

Circle No. 19 on Readers' Service Card

Packing machine

Versapak, an automatic sleeve wrapping machine, is said to sleeve wrap any form of produce at the rate of up to 1800 units per hour. This machine automatically feeds film from two webs up to 18-in. wide. After produce packages are inserted, the device delivers them to an electronically controlled impulse sealing head which forms the sleeve in a single operation. *Versapak Corp.*

Circle No. 20 on Readers' Service Card

Pressure reducing valve

Available in 4- and 6-in. sizes, this sliding gate and plate pressure reducing valve has a capacity of 50,000 lb./hr. of steam or 2,500 gpm of water.

Both pilot and main valves have sliding gate seats (self-cleaning and self-lapping), a factor said to cut maintenance, eliminate wire drawing, and give more accurate regulation. *OPW-Jordan Corp.*

Circle No. 21 on Readers' Service Card

Ball valves

McCannaseal, top-entry ball valves are now availalbe with socket weld connections in 1- 1½- 2- and 3-in. sizes. This design permits the valve body to be permanently welded into the pipeline with access provided by a removable bonnet and stem assembly. In addition to low pressure drop, two-way flow, and quarter-turn operation, these ball valves are said to assure driptight service for hundreds of thousands of cycles. *Hills-McCanna Co.*

Circle No. 22 on Readers' Service Card

Flow switch

This switch has been designed to respond to the lack of material at a critical point in a bulk material handling system and automatically correct the difficulty or sound an alarm.

It can be installed in all types of feeder and conveyor troughs, in the discharge openings of bins, and chutes of dryers, crushers and other processing equipment. *Syntron Co.*

Circle No. 23 on Readers' Service Card

Strapping calculator

A free steel strapping calculator has recently been made available. This device computes the pounds of strapping needed for a given package size, figures total strapping necessary for a given production run, calculates the strapping cost per unit for any package and indicates the quantities at which favorable price breaks are available. *Signode Steel Strapping Co.*

Circle No. 24 on Readers' Service Card

Rando-web making machine

The new Rando Feeder-Webber is said to produce continuous uniform Rando-Web structures from 100 per cent short fiber. The machine will handle short fibers such as bleached sulphite pulp, linters, fiberized paper, metal fiber, fiberized

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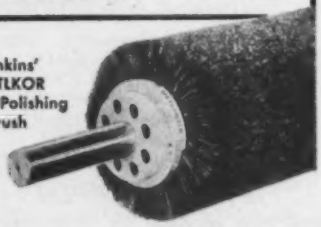
Jenkins' METLKOR brushes, teamed with Viking's Void Detector, check every inch of paper as it is made, find holes, measure them, count them, record them, pinpoint their positions and signal the operator, all automatically. The Jenkins' feeler brush, a critical part of the system, sends a low voltage pulse to the Viking Indicator Unit whenever a hole appears.

John Glump, Vice-President of Viking Instruments, Inc., of East Haddam, Conn., says: "Jenkins' brushes do a superb job for us. They are an improvement on 13 counts:

1. Improve accuracy of flaw detection.
2. Have no abrasive effect on product.
3. Eliminate lint problem.
4. Outlast previous brushes 3 to 1.
5. Made exactly to size, no cutting or alterations necessary.
6. Simplified mounting.
7. Improved construction.
8. Superior bristles.
9. Refillable when bristle is worn.
10. More economical.
11. Free engineering service.
12. Speedy solution to problem.
13. Quick delivery."

Jenkins' METLKOR Paper Polishing Brush



Jenkins' also makes the following brushes for the paper industry:

Conveyor Cleaning • Blanket Washer • Fourdrinier Wire Cleaning • Polishing • Coating • Dusting • Dampening • Spray • Sieve • Static Elimination • Flocking • Felt Cleaning • Feed or Carrier • Paint Brushes • Floor Sweeps

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New Products . . .

leather, flexible plastic foam, flock and other special materials. *Curlator Corp.*

Circle No. 25 on Readers' Service Card

Controlled laboratory

The TMI-100-1 "Uni-Lab" is a laboratory room capable of producing and maintaining controlled temperature and humidity (within 70° to 80°F. dry bulb temperature, and 40 to 75 per cent relative humidity). The room is fully insulated, contains the necessary air movers, cooling and heating coils, humidifying apparatus and associated electrical and control equipment. *Testing Machines Inc.*

Circle No. 26 on Readers' Service Card

Storage tanks

Heavy-duty, glass reinforced polyester tanks for strong and processing corrosive liquids have been developed and are available in 20 to 20,000 gal. capacities. A 1000-gal. tank weighs approximately 350 lbs., and reinforced plastic mounts are located according to the user's specifications. Ready observation of the liquid level within the tank is made possible by the translucence of the structure. *Justin Enterprises Inc.*

Circle No. 27 on Readers' Service Card

Rotary knife cutter

A new heavy-duty, high-speed, extreme-precision rotary knife cutter capable of handling film sheets up to 48-in. wide has recently been developed.

This machine is designed primarily for the granulating of thin scrap polyethylene sheets having a thickness of but from one to two thousandths of an inch. *Sprout, Waldron & Co. Inc.*

Circle No. 28 on Readers' Service Card

Tank lining

Penton chlorinated polyether tank lining is said to provide protection against virtually all organic and inorganic agents, resisting all inorganic acids except fuming nitric and fuming sulfuric. *U. S. Stoneware Co.*

Circle No. 29 on Readers' Service Card

Centrifugal pumps

Built in two sizes for capacities up to 100 gpm, these sealless (canned) pumps are claimed positively leak proof. They have no mechanical seals, stuffing boxes or glands; such features made possible by combining motor and pump in an integral unit.

The design of this unit permits the liquid being pumped to circulate within the motor, while the motor parts in contact with the pumped liquid are protected by corrosion-resistant liners. *Goulds Pumps Inc.*

Circle No. 30 on Readers' Service Card

Steam trap

The cut-away view shows a new impulse steam trap, with blowdown valve and strainer combined in a single unit, requiring only two connections. It is designed for light condensate loads with steam pressures from 8 to 600 psi, and operates against back pressures up to 50 per cent of the steam line pressure. *Yarnall-Waring Co.*

Circle No. 31 on Readers' Service Card

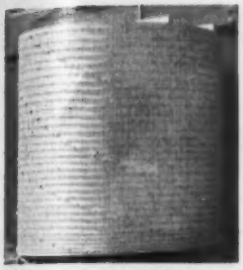
Ream gage

Shown in the above, the PEDCO, chrome plated, ream gage, has been introduced for use in paper mills, printing plants and offices. It is completely adjustable from ⅛- to 5½-in., and can be used with virtually any type of paper, irrespective of thickness. *Paper Equipment Distributing Co.*

Circle No. 32 on Readers' Service Card

Wire cloth calculator

Engineers and plant personnel who operate equipment which utilizes woven wire



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For more data circle 142 on Post Card

Absolute Condensate Control for STEAM-HEATED PRODUCTION

New TEMP-A-SURE

CONDENSATE CONTROL

TEMP-A-SURE is the answer to the temperature problem in your steam-heated production set-up. Simple installation—no hot-and-cold shots—no fluctuating temperature. Utilizing our new principle of measuring the Rate of Latent Heat Transfer, ***TEMP-A-SURE*** Condensate Control will remove condensate and non-condensable gases instantly and accurately. Responding immediately with 100% modulation, ***TEMP-A-SURE*** acts as a perfect temperature control when serving heat transfer equipment, provided the steam pressure is kept constant. Write us for further information.

60 DAY SATISFACTION GUARANTEE!

The Swiss Colony Engineering Division, Dept. K2 Monroe, Wisconsin

For more data circle 143 on Post Card

New Products . . .

cloth may now have, free, a newly designed calculator. This ,device provides means for determining flow rate, pressure drop, particle retention, wire diameter, widths and types of weaves. *Multi-Metal Wire Cloth Co. Inc.*

Circle No. 33 on Readers' Service Card

Pneumatic atomizing nozzles

The service of manufacturing pneumatic atomizing nozzle assemblies to customers' specifications is now being made available by Spraying Systems Co.

To accomplish this, either standard or special fluid and air nozzles are mounted to specially built body assemblies. Fig. 1 is an example where two nozzles were needed, each with a clean-out needle assembly, only under limited space. The required opposed projection was obtained, with the single compact unit shown, employing a common body for both nozzles. In Fig. 2, four nozzles had to be mounted in an extremely narrow opening. All four were mounted on a special body manifold that incorporated a common air and liquid inlet, with each nozzle individually controllable with a separate shut-off needle.

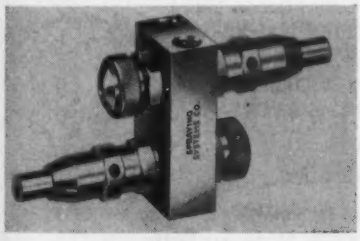


Fig. 1

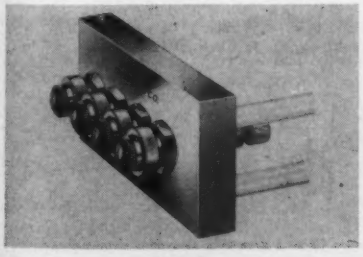


Fig. 2

The company states that special pneumatic atomizing nozzle assemblies of this type can be designed to meet almost any requirement with a choice of round, wide angle round and flat sprays in a wide range of spray angles and capacities. *Spraying Systems Co.*

Circle No. 34 on Readers' Service Card

Corrosion preventative

Seculate, a new hard-drying coating, is said to insulate and prevent the temperature difference which causes moisture from the air to deposit on cold surfaces; and in addition, will absorb part of the moisture and then gradually release it when the air becomes dry. *Chemical Concentrates*

Circle No. 35 on Readers' Service Card

Proportional sampler

An automatic proportional sampler for measuring waste, process or steam flow has been developed to feature a slow speed pumping unit which delivers a continuous sample to a plastic splitter box. The unit takes samples automatically proportional to flow utilizing signals transmitted by the flow meter. *Plasti-Fab*

Circle No. 36 on Readers' Service Card

High-capacity valve

A high-capacity valve has been developed to offer a completely streamlined flow for filtrate in single-and multiple-stage continuous filters. All internal obstructions have been eliminated according to the manufacturer. *Dorr-Oliver Inc.*

Circle No. 37 on Readers' Service Card

Saturator

A new type saturator, called the Rando-Bonder, is said to make possible the rapid, uniform saturation of nonwoven webs, without drafting or distortion.

This device features open construction permitting accessability and observation of chemical application, and fabrication of chemically exposed parts from corrosion resistant stainless steel. *Curlator Corp.*

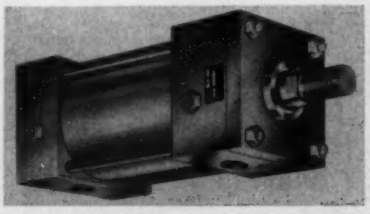
Circle No. 38 on Readers' Service Card

Polypropylene gate valve

A new line, polypropylene throttleable gate valves, has been added to this company's plastic corrosion resistant fluid handling products. These valves are light in weight and are said to have high strength and chemical resistance in addition to possessing excellent resistance to most solvents, greases, oils, and the majority of common acids at temperatures up to 185°F.

They are available from stock in sizes, from ½ to 2 in. with socket-weld, flanged or screwed ends and combine the features of straight through no pressure drop flow with close throttling control. *Vanton Pump & Equipment Corp.*

Circle No. 39 on Readers' Service Card



Interchangeable cylinder

These series "A" cylinders, according to the manufacturer, can be used without

modification in either air or hydraulic systems. Featuring reverse trim packings and a multiple-lip rod wiper that cleans in two directions, this cylinder can be used for all types of industrial applications at pressures up to 200 psi air and 500 psi oil or water. *S-P Manufacturing Corp.*

Circle No. 40 on Readers' Service Card

Check valves

Inert to the action of most chemicals, these porcelain check valves incorporate a flanged porcelain body, guided porcelain cone or alumina ball check, and a Teflon seat. Recommended for up to 150 psig pressure, the assemblies may also be modified for spring load operation, and are available in sizes from ½ to 3 in. *Process Equipment Div., Lapp Insulator Co.*

Circle No. 41 on Readers' Service Card

Embossing machines

A new embossing machine with 13-in. diameter embossing rollers features a closed hydraulic-loading system and is said to afford uniform impressions over the entire web surface. It is air-actuated for instant response. A lift-out arrangement for both impression and embossing rollers permits rapid changeover for new patterns. *Dietz Machine Works*

Circle No. 42 on Readers' Service Card

Continuous unwind

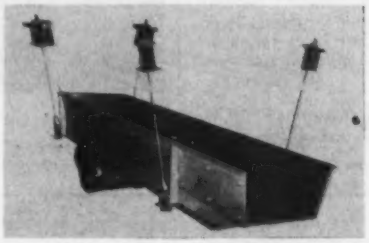
The Model 21 is a two-position rotable unwind, handling rolls up to 2000 lb. and 36 in. diameter for shafted or shaftless operation. This unit features: Dancer roll controlled pneumatic tension, automatic controlled sidelay, cut-off knife and pressure roll. *Black-Clawson Co.*

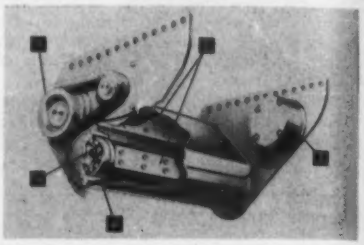
Circle No. 43 on Readers' Service Card

Nip & crown check

The Nip Width Tester is a metal dispenser containing a roll of 6-in. wide embossed aluminum foil. Pressure applied to rubber covered rolls when the foil is in place creates a flattened area on the foil, thus permitting a quick visual check of the nip contact area. *Stowe-Woodward Inc.*

Circle No. 44 on Readers' Service Card





Straightline feeding

This gearless feeder incorporates the principle of vibration and can be cable-suspended or floor-mounted for controlled feeding of ore, coal, rock and numerous heavy and highly abrasive bulk materials.

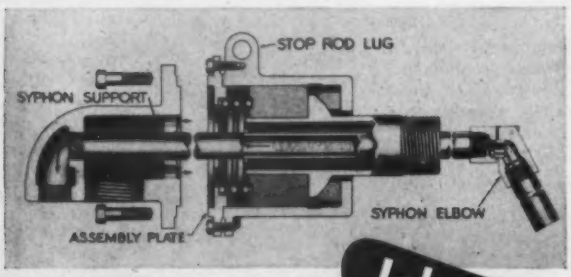
The vibrator's two unbalanced shafts, driven by individual pancake motors, produce the straightline feeding motion. They rotate in opposite directions causing the motors to synchronize despite absence of direct coupling between shafts.

The cutaway view shows: 1. Labyrinth bearing seals; 2. Automatically synchronized unbalanced shafts; 3. Spherical roller bearings; 4. Grease lubrication; 5. Integral pancake motors. This new line is available in two models and 30 sizes, with capacities up to 1,350 t.p.h. *Link Belt Co.*

Circle No. 45 on Readers' Service Card

Rotary Joint Headquarters

★ Johnson started the whole idea. Today's *complete* line includes sizes from ¼" to 8" . . . self-supported, pipe-supported, or rod-supported . . . for stationary or rotating syphon pipe . . . all operating speeds and pressures . . . for paper machines, calenders, corrugators, waxers, embossers, roofing machines, printing presses.



Type SDP shown. Hinged syphon elbow replaces unwieldy curved syphon pipes with two straight pipes. Newest Johnson development is the Quick Release nipple. Write for Bulletin S-3001.

Johnson Rotary Pressure Joints

First in the Paper Industry

THE JOHNSON CORPORATION
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BILL FRENCH

Lindsay Wires
Knox Woolen Felts
Mount Vernon Dryer Felts

Carrier Rope, Splicing Tissues, Deckle Webbing, Apron Cloth, Wire Brushes

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NEW LITERATURE

Books

U. S. BUSINESS IN JAPAN. Prepared and published by Business International, 200 Park Ave., New York. Pages: 61. $35.00.

This practical research volume indicates the ways companies have overcome the many legal restrictions in setting up Japanese operations. Further it tells how firms long established in Japan have solved important operating problems such as negotiating with labor, protecting patents and trade marks and maintaining good relations with the government. The report frankly discusses the difficulties confronting American investors and licensors, including the often restrictive attitude of the government and certain sections of the business community.

ACRYLIC RESINS. By Milton B. Horn, Catalin Corp. of America. Published by Reinhold Publishing Corp., New York. Pages: 175. $4.50.

The four types of acrylics are described in respect to their manufacture, fabrication and application. These types include cast products, molding compounds, emulsion and solution compounds. The author explains raw materials and manufacture of these polymers sufficient to an understanding of the problems involved in fabrication and application. He then covers the current and future developments in terms of potential use in a great variety of products.

USDA Reports

REPORT NO. 2170, The Effect of Environmental Factors on Wood Quality, has recently been made available by Forest Products Laboratory, Madison 5, Wis. This new report describes the effects that specific environmental factors, such as climate and soil, have on the growth of trees and explains how certain structural characteristics of the wood caused by growth conditions affect its quality.

Manufacturers' Publications

These items are numbered for your convenience. Copies of the publications may be requested at no obligation through our Readers' Service Dept. Use the handy business reply card which accompanies this issue.

Bleaching tower

Dorr-Oliver Inc., in a four-page brochure, describes its recently introduced concentric bleaching tower design. This design provides high density chlorine dioxide bleaching of kraft and other pulps in a single compact structure. Primarily designed for the preparation of paper pulp, the tower design is claimed applicable to the treatment of many solid materials in pulp or slurry form.

Circle No. 46 on Readers' Service Card

Steel grating and treads

Kerrigan Iron Works Co. of Nashville, Tenn., is offering an 11-page bulletin describing the company's steel gratings and treads. The bulletin is full of photos showing plant installations. Specification charts and engineering data are also given.

Circle No. 47 on Readers' Service Card

Quick couplings

Perfecting Service Co. is offering a bulletin covering their newly designed coupling which is interchangeable with the four major couplings and most all industrial couplings. This product features; pushomatic action, one hand operation, full swivel action and automatic locking.

Circle No. 48 on Readers' Service Card

Volatile liquid pumps

Layne & Bowler Inc. has published a 6-page bulletin on the Layne Volatile liquid pumps. This literature includes cross-section drawings of the standard short coupled vertical turbine pump and the canned type vertical turbine pump with uses and applications illustrated.

Circle No. 49 on Readers' Service Card

Productivity guide

Eddy-Rucker-Nickels Co. has made available a guide which applies productivity measurement to management control, incentive payments, product pricing and labor-management negotiations.

Circle No. 50 on Readers' Service Card

Rotary table feeders

Chain Belt Co. is offering a bulletin describing its standard Rex rotary table feeders. This literature contains outline drawings, dimensions and specifications covering the three standard Rex feeders available.

Circle No. 51 on Readers' Service Card

Refiner

Bauer Bros. Co. has made available a bulletin describing their recently developed pump-through refiner. This literature contains specifications of the refiner and includes a list of optional features, such as automatic control through couch vacuum, remote control consoles, and various accessories.

Circle No. 52 on Readers' Service Card

Chemical resistance of polyesters

Atlas Powder Co. is offering a report on how three different polyester resins — bisphenol-A, isophthalic, and general-purpose — withstood a six-month immersion in various corrosive aqueous solutions at elevated temperatures.

Circle No. 53 on Readers' Service Card

Pneumatic computing relay

Fischer & Porter Co. has made available a catalog describing the Sorteberg Force Bridge, a pneumatic computing relay. Detailed application data is listed for each of the computer's opera-

Don't Give an Inch — to FOAM

use Dow Corning Silicone Defoamers*

There's a *right* tool for every job. In foam control it's Dow Corning silicone antifoamers or defoamers . . . job-proved thousands of times over as the most efficient, most economical, and most versatile foam suppressors available.

*At prescribed levels, are sanctioned by FDA

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Please rush a FREE SAMPLE of a Dow Corning silicone defoamer for my product or process, which is (indicate if food, aqueous, oil or other): _____

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POSITION _____

COMPANY _____

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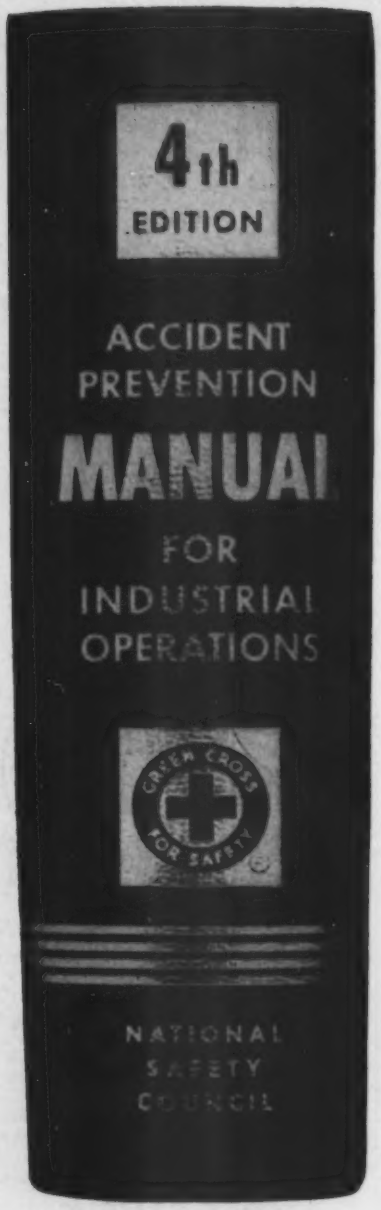

The new *4th Edition of the Accident Prevention Manual* contains over 1500 pages, over 500 illustrations and photographs—was reviewed by nearly 400 safety specialists from all industries before publication. It's the most complete, most accurate, most up-to-date safety manual available.

Single copy price $15.50. Use this stock number (121.51) when ordering.

NATIONAL SAFETY COUNCIL

425 North Michigan Ave., Chicago 11, Illinois
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tions which include: multiplication, division, squaring, square root extraction, square root extraction with pressure compensation, simultaneous multiplication and division and ratio setting.

Circle No. 54 on Readers' Service Card

Bleach plant equipment

Improved Machinery Inc. has published a 46-page booklet as a guide in planning a bleach plant. The company's equipment which is manufactured for this purpose is shown and fully describes the principles involved for each type of equipment. Complete diagramatic flow sheets also show typical installations for different type plants.

Circle No. 55 on Readers' Service Card

Coating bulletin

Black-Clawson Co. has issued a new bulletin outlining the developments of the Dilts Division in the coating field. This 40-page booklet includes information on machinery, technical services, and provides paper samples.

Circle No. 56 on Readers' Service Card

Belt feeder

B-I-F Industries has issued a bulletin on the Omega Hi-Weigh belt gravimetric feeder for continuous feeding of large quantities of dry materials. This data sheet includes performance specification, principal dimensions and accessories.

Circle No. 57 on Readers' Service Card

Paper sampler

Testing Machines Inc. announces the availability of a data sheet which illustrates and describes the TMI paper sampler. The unit is designed for use on comparatively slow moving webs of speeds up to approximately 400 f.p.m.

Circle No. 58 on Readers' Service Card

Professional and Business Services

J. E. SIRRINE COMPANY
ENGINEERS Since 1902
GREENVILLE, SOUTH CAROLINA

Design — Consultations
Paper & Pulp — Reports
Water & Waste — Appraisals
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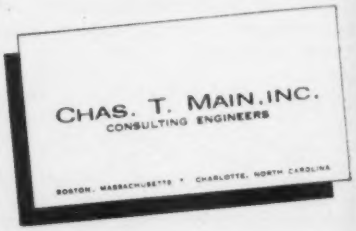
Engineering for the PULP and PAPER INDUSTRY



Design Engineer

The rapidly expanding requirements of our engineering department require the addition of a design engineer of proven capability. The man we seek must be familiar with paper machine design or have experience in heavy machinery. He must be willing to work on the board sufficiently to finalize his layouts so the job can be finished by detailers. He must have leadership qualities to assume increasing responsibility in a growing organization.

Please reply with resume & present salary to:

Personnel Director
Valley Iron Works Corporation
Subsidiary of Allis-Chalmers Mfg. Co.
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RETIRING?

Add to your retirement income by making your paper mill knowledge pay off. Spare time. No selling. Write Box 690, The Paper Industry.

WANTED FOR IMMEDIATE PURCHASE

One used Saveall Bird Size 7A or Equivalent Gravity Unit. Good Condition. Forward particulars to Box 704, The Paper Industry.

WANTED

Chemical Engineer for research and development work with growing specialty paper board mill in Eastern N. Y. State. Employees know of this Ad. Address replies to Box 705, The Paper Industry.

PAPER MILL ENGINEER

We are a midwest paper mill seeking the services of a graduate engineer, age 35 to 42, who has had at least 10 years experience in cylinder board operations and related stock preparation. All replies will be held strictly confidential. Please forward resume to Box 706, The Paper Industry.

PAPER MILL SUPERINTENDENT

Northeastern fine paper producer seeks a mature man who has 15 or more years of practical experience in bond and/or book paper mill operations covering machines running 700-1000 ft./min., and 5 years or more as tour boss and superintendent. A man who has taken early retirement but wishes to continue full-time work will be fully considered. Must have good intelligence and common sense, and a high degree of motivation and responsibility. Interest and ability in adaptation improvements is highly desired. Desirable salary. Please send complete details in full confidence. Write Box 707, The Paper Industry.

GET THE SCOOP ON SCOOPS

If you have a dryer drainage problem, don't do anything about it until you see the movie—

"Condensate Behavior in Rotary Dryers"

This 15 minute sound color film shows what goes on inside a dryer at a wide range of speeds . . . shows why conventional syphons lose efficiency at higher speeds . . . shows how to get condensate out at any speed. For a showing, contact your Armstrong Representative or write direct.

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ARMSTRONG MACHINE WORKS
8165 Maple Street Three Rivers, Mich.
Manufacturers of Armstrong Inverted Bucket Steam Traps
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Eight Publications for Papermakers

Paper and Paperboard Making (Williamson)	6.00
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Notes and Observations on Beaters	1.00
Trouble on the Paper Machine	.75

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for accurate measurement of
Brightness and Opacity
of pulp and paper in terms of TAPPI specifications.
Also for ***Gloss and Color***
tests on paper, card board, and other paper products.
Portable, reliable, rugged, simple to operate
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MODEL AK AUTOMATIC

FOR CHIPPER—HOG—PAPER—VENEER KNIVES — ROTARY CUTTERS — DOCTOR BLADES — SHEAR BLADES, ETC

EXTRA HEAVY DUTY Traveling Wheel Type
Capacity— 84" to 396"
Motors— 7½ to 40 HP
Speed—10' to 100' and faster
TRANSMISSION DRIVES
Mechanical—Constant Speed
Hydraulic—Variable Speeds
WHEELS
Cylinder or Segmental Types
16 — 20 — 24" Diameter

1. Guaranteed Construction
2. Finest Materials
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4. Quiet, Smooth Running and Entirely
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GUARANTEED PERFORMANCE
REAL WORK HORSES

We Guarantee our Machines to Deliver the Maximum in Precision Ground Knives per Hour with the Finest and Sharpest Edges for Longer and Better Cutting Action

MODEL GK AUTOMATIC

HEAVY DUTY Traveling Table Type
Capacity — 32" to 196"
Motors — 5 - 7½ - 10 - 15 HP
Table Speeds — Hydraulic (10' to 80' per min.); Mechanical (Constant)
Gears — Hardened
Bearings — Ball and Roller Types
OTHER MODELS
MODEL "DN" — For normal knife requirements — Sizes — 32" to 108"; Motors — 3 - 5 HP; Wheels — 10" to 14" Diameter — also Straight Wheel and Circular Knife Grinders

TABLE DRIVES
Mechanical
Hydraulic
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Main Plant BIG RAPIDS, MICHIGAN
West Coast PORTLAND 1, OREGON
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Get out the dirt... *she doesn't see!*

D-I LESTOIL LIQUID DETERGENT

No matter what grade of raw stock you use... no matter what care you take in sorting... there's always the danger that grease, oil, wax and other contaminants will get by — to create specs or shiners or otherwise blemish your finished sheet.

Today... increasing numbers of smart mill operators insure against these costly headaches by adding D-I LESTOIL when cooking rags.

D-I LESTOIL speeds up wet-out, assures uniform packing and cooking in the boiler; thoroughly penetrates every fiber. It emulsifies and disperses grease, graphite, wax... all dirt. Produces fibers free of soil, fibers that bleach readily and absorb dye uniformly.

D-I LESTOIL guards against redeposition of soil ... permits complete, free rinsing.

End result? Clean, bright sheets of uniform color and quality.

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LESTOIL, INC. 910 Garfield Street
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Please send me information about d-i LESTOIL and complete directions for use.

NAME _____ **TITLE** _____

FIRM _____

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CITY _____ **STATE** _____

For more data circle 151 on Post Card

MARKET QUOTATIONS

RAGS (Domestic)

New Cotton Cuttings

The following are brokers' and large dealers' average buying prices for sizeable lots in cents per pound f.o.b. New York:

	per cwt.
No. 1 white shirt cuttings	13.00— 13.50
Soft unbleached muslins	15.50— 16.00
Fancy shirt cuttings	4.50— 5.00
No. 1 percales	5.50— 6.00
No. 1 washables	2.25— 2.50
No. 1 light silesias	6.50— 7.00
No. 1 light prints	4.75— 5.00
Light flannelettes	6.50— 7.00
Cottonades	2.75— 3.25
Blue overall cuttings	6.75— 7.25
Blue cheviots	6.75— 7.25
Canton flannels, bleached	10.50— 11.00
Canton flannels, unbleached	10.50— 11.00
Osnaburg cuttings	9.50— 10.50
Underwear cuts, bleached	14.50— 15.00
Underwear cuts, unbleached	14.50— 15.00
Sun tan khaki cuttings	5.00— 5.50
American linen cuttings	6.75— 7.25

Cotton Rags

The following are prices, cents per pound, paid by dealers and brokers f.o.b. New York:

	per cwt.
No. 1 roofing (Chicago)	.50— .55
No. 2 roofing (Chicago)	.40— .45
Twos and blues, repacked	1.75— 2.00
Thirds and blues, repacked	1.50— 1.75
No. 1 whites, repacked	—
No. 1 whites miscellaneous	—
No. 2 whites, repacked	—
No. 2 whites, miscellaneous	—

RAGS (Foreign)
(ex dock New York City)

New Rags

	per cwt.
New dark cuttings	Nominal
New mixed cuttings	
New light silesias	
Light flannelettes	
Unbleached cuttings	
New white cuttings	
New light oxfords	
New light prints	

Old Rags

	per cwt.
No. 1 white linens	Nominal
No. 2 white linens	
No. 3 white linens	
No. 4 white linens	
No. 1 white cottons	
No. 2 white cottons	
No. 3 white cottons	
No. 4 white cottons	
Extra light prints	
Ordinary light printe	
Medium light prints	
Dutch blue cottons	
French blue cottons	
French blue linens	
Checks and blues	
Linsey garments	
Dark cottons	
Old shopperies	

ROPE and BAGGING
F.o.b. and ex dock New York City

Gunny No. 1, domestic	—
Gunny No. 1, foreign	—
No. 1 manilla rope, domestic	—
No. 1 manila rope, foreign	—
New burlap cuts (soft)	—
Sisal strings	—
Mixed strings	—

WASTE PAPER

The following are prices, dollars per net ton, paid by brokers and large dealers for carload quantities of baled stock, f.o.b. cars New York:

No. 1 hard white envelope cuttings	95.00—100.00
No. 1 hard white shavings	80.00— 85.00
No. 1 soft white shavings	50.00— 55.00
Soft white shavings, uncoated	60.00— 65.00
Fly leaf shavings No. 1	17.00— 22.00
Fly leaf, woody, No. 1	17.00— 20.00
Mixed colored shavings	16.00— 18.00
No. 1 books and magazines	18.00— 20.00
Ledger stock, white, No. 1	40.00— 45.00
Ledger stock colored, No. 1 (Midwest ship)	30.00— 32.50
New manila envelope cuttings (free of groundwood)	55.00— 60.00
New manila envelope cuttings (containing groundwood)	45.00— 50.00
Manila tab cards	55.00— 60.00
Colored tab cards	42.50— 45.00
New northern kraft envelope cuttings	55.00— 60.00
Triple sorted kraft, 100%	35.00— 37.50
No. 1 old kraft	25.00—
White news cuts, No. 1	32.50— 37.50
No. 1 overissue news	15.00— 17.00
Folded news, special	13.00— 14.00
Folded news, ordinary	11.00— 12.00
Old corrugated boxes	15.00— 16.00
New jute corrugated cuts	19.00— 20.00
Mill wrappers	9.00— 11.00
Boxboard cuttings	4.00— 5.00
No. 1 mixed paper	1.00— 6.00

CHEMICALS
F.o.b. New York City

Alum, ammonium	
Granular, bags, works, cwt.	4.30—
Lump, drums, works, cwt.	5.05—
Powdered, drums, works, cwt.	5.20—
1-Arginine, drums, kilo	90.00—
Blanc Fixe	
Direct process, bags, c.l., works, ton	160.00—
L. c. l., ton	170.00—
Bleaching Powder, drums, cwt.	—
Casein, domestic acid precipitated	
30-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.56—
80-mesh bags, 10,000-lb. lots or more, shipping point, lb.	.64—
China Clay, domestic dry-ground, airfloat, 99%	
325-mesh bags, c.l., Georgia works, ton	11.00— 17.00
300-mesh bags, c.l., Georgia works, ton	13.50— 22.50
Imported, white, lump, bulk, c. l., ex dock Phila, Portland, Me., gross ton	23.00— 35.00
Chlorine, liquid	
Tanks, single units, works, freight equaled, cwt.	3.25—
Glycerine, refined (CP, USP) 99%, drums c. l., delivered lb.	.30⅞—
Litharge, commercial powdered	
Barrels, c. l., works, freight equaled lb.	.14¼—
Rosin, gum, c. l., f.o.b. New York, cwt.	
K, M	17.75—
N	17.85—
WG	18.10—
WW	18.25—
Rosin, wood, c. l., f.o.b., shipping point, cwt.	
K, M	12.00— 12.25
N	12.35— 12.45
WG	12.55—
WW	12.75— 12.85
Saltcake, domestic, bulk works, 100% Na_2SO_4 basis ton	28.00—
Soda Ash	
Dense, 58%, paper bags, c.l. works, cwt	1.90—
Light, 58%, paper bags, c.l. works, cwt	1.85—
Soda, caustic	
Flake, 76%, drums, c. l. works, freight equalled, cwt	5.20—
Solid, 76%, drums, c. l. works, cwt.	4.80—
Sodium Silicate	
40°Be, 1:3.2, turbid, drums, c. l., works, cwt.	1.65—
52°Be, turbid, 1:2.4, drums, c. l., works, cwt.	2.65—
Starch	
Pearl, 140-lb. bags, cwt.	7.51—
Pearl, 100-lb. bags, cwt.	7.36—
Powdered, 100-lb. paper bags, cwt.	7.48—
Sulfur, crude	
Bulk, c. l. mine, contract, long ton	23.50—
Talc	
Domestic, fibrous, N. Y., grd., bags, c. l. works, ton	28.00—
Canadian, ground, bags, c. l. works, ton	20.00— 35.00
Titanium Pigment	
Calcium-rutile base, regular, bags, c. l., lb.	.09⅛—
High-tinting, drums, c. l., lb.	.14⅛—
Zinc Oxide Pigment, American process	
Lead-free, bags, c. l. freight allowed, lb.	.14½—
Leaded, 35%, bags, c. l., freight allowed, lb.	.15⅛—

WOOD PULP

Quotations on domestic and Canadian pulp, dollars per short air-dry ton delivered consuming mills including basic allowances, follow:

Bleached sulfite, No. 1	155.00—
Bleached sulfite, Canadian	155.00—
Unbleached sulfite	135.00—
Unbleached sulfite, Canadian	135.00—
Bleached soda	150.00—
Bleached soda, Canadian	150.00—
Kraft, bleached hardwood	152.00—
Kraft, bleached	157.00—
Kraft, bleached southern	160.00—
Kraft, bleached Canadian	160.00—162.50
Kraft, unbleached southern	120.00—
Kraft, unbleached, Far West	125.00—
Kraft, unbleached Canadian eastern	135.00—
Kraft, unbleached Canadian western	120.00—125.00
Kraft, semi-bleached southern	140.00—
Sulfite screenings	—
Sulfate screenings	—

Quotations on imported wood pulp dollars per short air-dry ton on dock American Atlantic ports, follow:

Bleached sulfite, Swedish, freight allowed	155.00—
Bleached sulfite, Norwegian, del'd with limited freight allowance	155.00—
Bleached sulfite, Finnish, freight allowed	155.00—
Unbleached sulfite, Swedish, freight allowed	135.00—
Unbleached sulfite, Finnish, freight allowed	135.00—
Kraft, unbleached, Swedish, freight allowed	125.00—
Kraft, unbleached, Finnish, freight allowed	125.00—
Kraft, bleached, Swedish, on dock	157.50—162.50
Kraft, bleached, Norwegian	155.00—

PAPER

Quotations are mill quotations Chicago

Boards (prices per ton, delivered in Chicago, 10 tons or more):	
Plain chip	107.50
News vat lined chip	110.00
.009 chip, rolls	100.00
Filled news	111.50
Solid news	114.50
White vat lined chip	144.50
Chip tube and can stock	112.50
Single manila lined chip	162.50
Single jute lined chip	147.50
Container, 42-lb.	
Kraft liner (per 1000 sq. ft.)	2.68
White patent coated	
.020	175.00
.018	177.50
.016	182.50
Book Paper (f.o.b. Chicago, c.l. skids per cwt):	
No. 1 enamels	20.80
No. 2 enamels	19.80
Machine-coated, 45- to 100-lb.	15.55— 19.00
60-lb. + uncoated offset, 25 × 38 (2000 lb.)	22.25
"A" grade English finish untrimmed, 25 × 38 (2000 lb.)	21.10
Rag Content Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	per cwt
100% rag	—
75% "	—
50% "	—
25% "	—
Rag Content Ledger (white, 5000 to 10,000 lb., ream sealed cartons):	
100% rag	—
75% "	—
50% "	—
25% "	—
Sulfite Bond (white, 5000 to 10,000-lb. sub 20, ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Sulfite Ledger (white, 5000 to 10,000-lb., ream sealed cartons):	
No. 1	—
No. 2	—
No. 4	—
Newsprint (contract base price)	per ton
Rolls, standard	135.00
Sheets	Standard differentials
Kraft Wrapping — Natural (standard rolls 9- and 15-in. diam.)	per cwt
70-lb. and heavier	9.00
60-lb	9.25
50-lb.	9.50
40-lb.	9.75
35-lb.	10.25
30-lb.	11.00
25-lb.	11.75
20-lb.	12.75
No. 1 Kraft Butcher — Pink	
	per cwt
40-lb. only	10.50
(Sheets — Plus 50c cwt)	

the sign of QUALITY

29 different* paper mills will start up NEW stock entrance equipment in 1960...

*DOES NOT INCLUDE TWO OR MORE INSTALLATIONS IN ONE MILL

by.. VALLEY

Consult VALLEY IRON WORKS CORPORATION

Subsidiary of Allis-Chalmers Manufacturing Company
Appleton, Wisconsin

West Coast Representative: E. A. Berry, P.O. Box 958, Longview, Washington
Canadian Representative: Pulp and Paper Mill Association Ltd., P.O. Box 850, Station "O", Montreal 9, Quebec

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Names in the News . . .

Western Michigan University

Dr. John H. Schulz has joined the paper technology faculty at Western Michigan University after completing his doctoral studies at the Institute of Paper Chemistry. He will replace Raymond L. Janes, who will begin doctoral studies at the Institute. He received his master's degree from the Institute in 1957 and completed his doctorate in June with Dr. J. A. Van den Akker. His thesis was "A study of the effect of straining during drying on the mechanical and viscoelastic behavior of paper".

Jamesbury Corp.

Edgar Rothschild has been appointed as sales coordinator. Prior to his new appointment, he was employed by Jamesbury in its contracts department, processing special government orders for current submarine programs and other military programs in which the company is active.

Arnold, Hoffman & Co.

George E. Motz has been appointed to the company's sales staff. He will service pulp and paper accounts in the South-Eastern states, working from the company's Atlanta sales office. Prior to this new appointment, Motz was serving as a representative for Nopco Chemical Co. for 14 years.

Plastic Papers Inc.

Dr. William Mullen, formerly plant manager, has been promoted to vice president in charge of production.

Kenneth J. Rawson, formerly general sales manager, will move to his new position as vice president in charge of sales.

George S. Price has joined the company as director of research. He was previously assistant manager of product development for Airkem Inc. of New York.

Necrology

Laurence F. Whittemore

Laurence Whittemore, was a retired chairman of Brown Co. since August 10. He began life as a $10-per-week worker in a railroad repair shop. In 1948 he became president of the New Haven railroad, but later went to the Brown company.

Robert Lindsay Moore

Robert Moore was vice president and treasurer of the Queen City Paper Co. He has been associated with the paper company for 51 years. He was planning to retire in a few months.

Charles H. Goodwin

Charles H. Goodwin has been assistant sales manager for Columbia Box Board Mills Inc. in Chatham, N.Y. Goodwin joined Columbia in May of 1952 in a sales capacity and became sales manager in 1960.

Robert H. Christian

Robert H. Christian was vice president and a director of Bathurst Power & Paper Co. Ltd. and also a director of Maritime Paper Products Ltd. He joined the Abitibi company at Montreal and became associated with Bathurst in 1947.

PAPER INDUSTRY

Whither?

... in production, processes, new products, markets

New system suppresses incipient explosions

Engineers of Fenwal Inc. demonstrated a system that detects an explosion at the instant of its inception and acts within a few thousandths of a second to literally snuff out the blast before it can become destructive.

The actions that take place within this fraction of a second following the inception of an explosion include: (1) envelopment of the explosion with a suppressant; (2) opening a path to the atmosphere for controlled relief of pressure; (3) introducing a suppressant into areas removed from the source of the explosion to prevent secondary explosions or fires; (4) blocking the explosion from other areas; and (5) automatic plant or equipment shutdowns.

Plastics to outwear steel in machine gears?

Polyurethane plastics can be prepared that are tougher than mild steel and show tremendous resistance to heavy loads and abrasion, according to C. F. Blaitch of the Garwin Co. When formed into solid wheels for lift trucks, these polyurethane elastomers can support up to 20,000 lb. per wheel. They have stood up for over three years under conditions that completely wore out rubber wheels in six weeks. It is suggested by Mr. Blaitch that these polyurethanes could be used as gears in machines for silent operation and long life.

Water from the sea at 40 cents/1000 gal.

Early in 1961 the first desalting plant based on a new process is expected to yield 500,000 gal. of fresh water per day for Israel's port city of Eilat, it is reported by Fairbanks, Morse & Co., a co-partner with the Israeli government in this development.

The process involves pumping water through pipes to a vacuum-freezing unit where it is instantly frozen into layers of brine and fresh water.

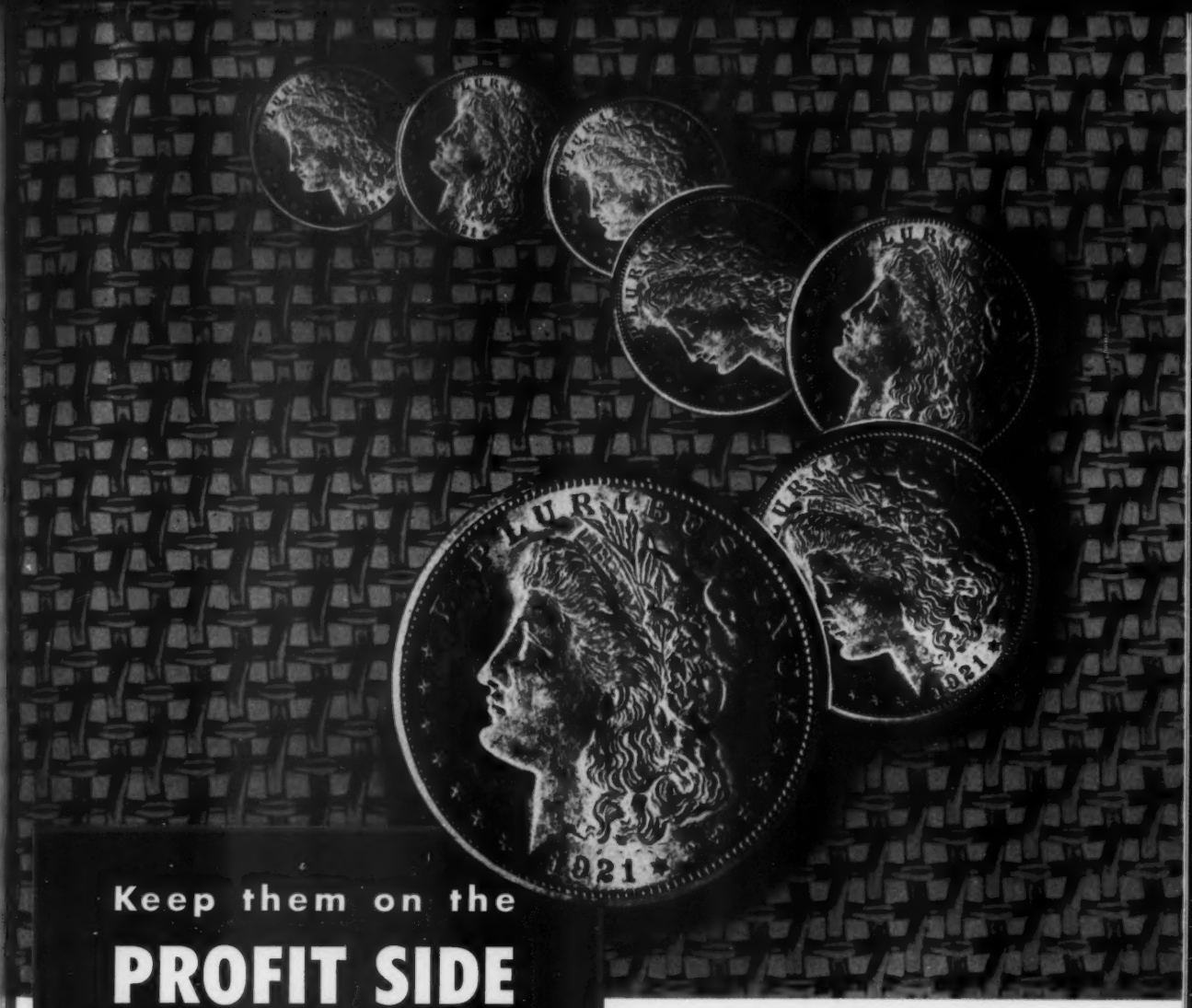
The layers are then effectively separated by a secret process which overcomes one of the traditional stumbling blocks to low cost salt water conversion.

Better chipping methods advocated

Sulfite pulps with improved strength and opacity and better formation qualities should be obtainable by changes in chipping methods to prevent bruising of ends of chips, according to Dr. L. B. Stockman of the Swedish Cellulose Industry. Bruised areas hydrolyze more rapidly in the low pH sulfite cook, resulting in weakened spots of the fibers according to Dr. Stockman. Short fibers also occur resulting in too rapid decrease of drainage with refining, so that optimum strength development cannot be achieved.

Retention of rosin size reduced by starch and titanium dioxide

Retention of rosin size by paper is markedly reduced by starch and titanium dioxide. Rosin size retention in one of the experiments was as low as 63 per cent. These losses are attributed to (1) formation of water-soluble complexes between starch and rosin soaps and (2) the fine dispersion of rosin acids by titanium dioxide.



Keep them on the

PROFIT SIDE

of the wire . . .

A significant increase in percentage of filler retained—**that's the DOLLAR-SAVING experience of more and more mills as a direct result of using a DARLING glue solution as a wet end additive.**

We'd like to work with you in determining what can be accomplished in your mill. The entire cost is on us, so you've nothing to lose—everything to gain. You can make arrangements through your DARLING sales representative. Or write or call us direct.

DARLING & COMPANY
GLUE DIVISION
4201 South Ashland Avenue • Chicago 9, Illinois

DARLING'S improved BONE GLUE

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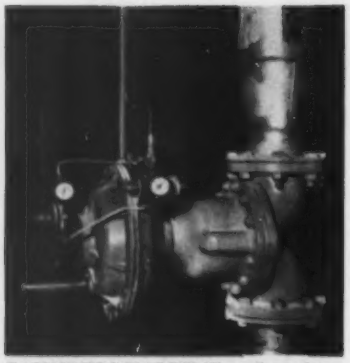
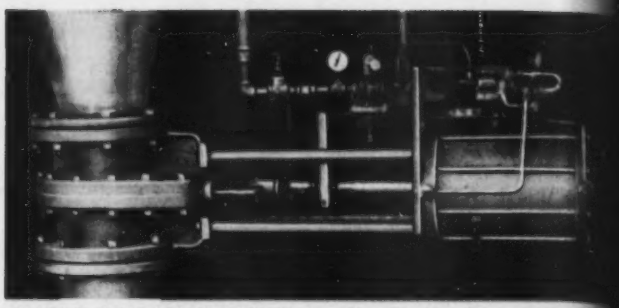


SAUNDERS VALVE (Conoflow close-coupled type) affords automatic throttling control of white water in bleach plant at Marathon Southern's Naheola, Alabama mill. Conoflow is the world's largest producer of Saunders valves for automatic control.

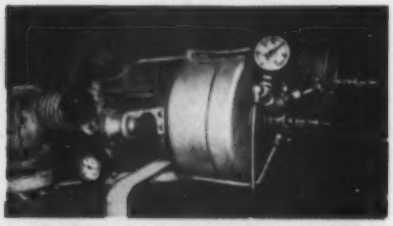


PULP STOCK VALVE (8" Walworth with Conoflow actuator) on automatic control service at Crossett Paper Mills, Crossett, Arkansas. Conoflow actuated pulp stock valves are available in all sizes.

CONOFLOW

CONTROLLED FLOW

AUTOMATION IN PAPER MAKING



CONTROL VALVES (Conoflow Series LB) on a tough service at the R-W Paper Company plant in Longview, Washington. These 2" single-seated angle valves are handling steam at 700°F. and 600 psi with a 580 lb. pressure drop.

The installations shown here are typical of how Conoflow final control elements have helped bring automation to the pulp and paper industry. Conoflow products make possible faster, more efficient operations, and substantial savings of costly process fluids for many modern paper mills.

VALUABLE DATA FREE! To find out where automatic process control can help you, write for Bulletin MD-1 *Application of Conoflow Equipment in Modern Pulp and Paper Making Processes.* Also ask for reprint *How to Use Standard Pulp Valves for Throttling Control*—a thought-provoking and informative article. Both will be mailed to you promptly, without obligation. Dept. C-901, Conoflow Corporation, 2100 Arch Street, Philadelphia 3, Pa. Conoflow engineering representatives are located in principal cities throughout the world.

PRESSURE TRANSMITTERS (Conoflow Model P) measuring pressure of pulp stock during bleaching process at the P. H. Glatfelter paper plant in Spring Grove, Pa. This is one of several Conoflow Model P's measuring pressure and liquid level at this mill.

CURRENT CONTROLLERS (Conoflow Model EB) regulating speed of washer thickeners in bleach plant at Marathon Southern mill in Naheola, Alabama. The Model EB is a unique pneumatic-electric transducer—a Conoflow exclusive for the paper industry.

BUTTERFLY VALVE (Conoflow actuated) on automatic control service at Crossett Paper Mills, Crossett, Arkansas.

CONOFLOW CORPORATION

FOREMOST IN FINAL CONTROL ELEMENTS

SUBSIDIARY WALWORTH

For more data circle 134 on Post Card